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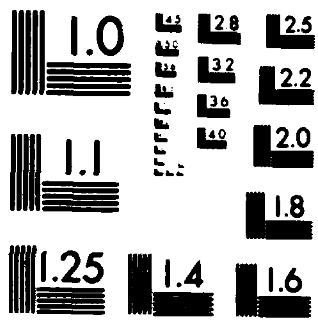

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COMMUNICATIONS SUPPORT PROCESSOR (CSP)

Informatics General Corporation

M. Gene Konopik and Robert B. Mack

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This report discusses the advanced capabilities developed for the Communications Support Processor and the impact these capabilities have on the system and its users. The technical performance of the CSP, the CSP system support functions and the on-site maintenance support are detailed in this report. The improvements to the CSP system include improved transportability site-unique gateways, on-line retrieval of traffic, plain language addressing an (the fully automated routing of messages.

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Item 19 (Cont'd)

Plain Language Addressing
AN/GYQ-21(V)
Fully Automated Routing of Messages (FARM)

Accession For		
NTIS GRA&I	☒	
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SECTION 1

1.0 Introduction

1.1 Purpose

The purpose of this technical report is to provide a discussion of the advanced capabilities developed and the impact these capabilities have on the system and it users.

1.2 Scope

This documents covers the following aspects of CSP:

- a descriptive discussion of the accomplishments on the advanced capabilities developed and/or analyzed.

- a discussion on the development of system support task, including installation support, configuration management, software quality assurance and software maintenance.

1.3 Report Organization

The CSP technical report is orginized into four sections. Section one serves as a general introduction to the CSP system: its development, incorporation, goals, and status. Section two describes the CSP capabilities and acomplishments. Section three itself consist of three parts. Part one of section three details the technical performance of the CSP. Included in this discussion are the following: improved transportability; site unique gateways; operating system upgrade; hardware/software analysis; online retrieval of traffic; improved message altroute capability; plain language addressing; and software interface to AUTODIN. The second part of section three describes the CSP system support functions. They include: CSP installation support; configuration management; software quality assurance; computer programs; and software maintenance. The third part of section three details on-site maintenance at the seven CSP sites. Finally, section four summarizes all conclusions and recommendations for the CSP.

1.4 Background

1.4.1 Initial Development

The Air Force Intelligence Service (AFIS). Directorate of Intelligence Data Management (IND) is manager of the Air Force Automatic Data Processing System (ADPS) for Intelligence Data Handling Systems (IDHS) - better known as ADPS-80. The ADPS-80 manager uses the CUBIC program as an orderly and systematic approach for developing, implementing, disseminating, maintaining and supporting certain common software for use by Air Force and other qualified agencies/activities that use AN/GYQ-21(V) minicomputers.

CUBIC, the Common User's Baseline for the Intelligence Community is a centralized management program for software design, development, maintenance and control, aimed at eliminating redundant software efforts by providing a set of standard systems/subsystems. CUBIC has also come to be known as the software architecture philosophy used in managing these software systems. The CUBIC philosophy entails active user determination of functional requirement priorities, centralized software development and maintenance, emphasis on modular software design lending itself to transportability, and software design that can be adapted to meet site specific needs.

The CSP was developed at Headquarters Strategic Air Command (SAC) as part of the Operational Intelligence Support System (OISS). In June 1978, the CSP was tested under the provisions of DoD Manual 5030.58 and accredited/certifed by Defense Intelligence Agency (DIA)/Defence Communications Agency (DCA) as a DSSCS/GENSER AUTODIN automated message processing exchange (AMPE). The CSP has been operational at HQ SAC since September 1978.

1.4.2 CUBIC Incorporation

AFIS/IND as the USAF ADPS-90 manager was aware of other intelligence user requirements to automate Special Security Offices (SSOs). Therefore in late 1978 AFIS adopted CSP as a CUBIC entity. This meant that CSP could be supported for various Air Force requirements and dovetailed with the HQ SAC effort to provide a single software baseline. CUBIC CSP was installed/accredited at HQ MAC in May 1979 and has been operational since June 1979. Subsequently CSP has been installed under the CUBIC program at PACOM Data Services Center (PDSC), Hawaii and at the U.S. Army Training and Doctrine Command Facility (TRADOC) TCATA, Ft. Hood, Texas.

In February 1980, a working group comprised of representatives from DIA, AFIS, RADC, SAC, and PDSC recommended to the Assistant Secretary of Defense for Command, Control Communications and Intelligence (C3I) that CSP be adopted as an interim standard for Special Security Office (SSO) Fixed Base Telecommunications automated message handling systems. This recommendation, which was subsequently approved, included appointment of AFIS/IND as executive agent for life cycle mangement of CSP software. In November 1980, the Director of DIA and the Air Force Assistant Chief of Staff/Intelligence signed the official CSP executive agent agreement.

1.4.3 Contract Goals

The contract goals were established to provide the following accomplishments in a timely manner:

- o Improved Transportability - This task included work required to facilitate distribution, configuration, installation. and subsequent support of the CSP.

- Site Unique Gateways - This included work to improve and standardize gateway interface techniques for the CSP as well as research and develpment of new gateways as directed by RADC and AFIS/IND.

- Operating System Upgrade - This included modifications to the CSP oriented to the interface to and use of the operating system (IAS). Also included in this task was work required to keep the CSP operable under the latest release of IAS.

- Hardware/Software Analysis - This included an analysis of the potential evolution of the CSP as related to hardware and software options.

- Online Retrieval of Traffic - This task equipped the CSP with the capability to retrieve traffic from the online system message file.

- Improved Message Alt-Route Capability - This provided enhancements to the existing CSP software which allow alternate routing of messages between selected output queues.

- Plain Language Addressing - This task allowed for input message traffic to the CSP either in the format specified for DD form 173, Joint Message Form, or as a fully formatted message from an intelligent OCR device.

- Software Interface to AUTODIN - This analysis examined the feasibility and work required to develop an interface to the AUTODIN ASC using only software.

- CSP Installation Support - This involved four phases of CSP installation: Site survey, base software configuration, software installation, and site-unique baseline definition.

- Configuration Management - This task ensured adherence to well defined procedures for implementing additions or modifications to the CSP standard system.

- Software Quality Assurance - This task resulted in the development and implementation of a Quality Assurance Plan. This assured compliance with all software requirements of the contract.

- Computer Programs - The objective of this item to ensure that the most current version of all CSP software was delivered to AFIS/IND for distribution.

- Software Maintenance - This task included work which provided centralized maintenance support for all CUBIC sites.

- On-site Maintenance - This task provided on-site software maintenance support to sites requesting this level of CUBIC support.

1.4.4 System Status

The CSP has been in operation for over 4 years. Since its initial operational date in September 1978, the system has compiled an impressive record of accomplishments. CSP down-time is recorded in terms of minutes-per-week; it has proven itself to be highly reliable in terms of protecting secure traffic; and it has never lost a message as a result of system design or software deficiencies.

CSP Release I as implemented at HQ SAC in 1978 was derived from the DIA SPINTCOMM facility software. However, functional, security and hardware changes required a 60% rewrite of the original system. Moreover, the current architecture bears little resemblance to SPINTCOMM design. CSP Release II as implemented under CUBIC auspices may almost be considered third generation, since many changes to improve modularity and transportability have been made. As a part of the CUBIC program, the CSP has been installed on a variety of different hardware configurations; and as a result, has become a modular system, readily configurable for installation into various environments.

SECTION 2

2.0 Communication Support Processor System Description

2.1 Functional Description

The Communications Support Processor (CSP) is a computer system designed to automate the functions of a Telecommunications Center (TCC) and serve as a communications front-end processor for analyst computer systems. Its development, distribution, and maintenance is under the auspices of AFIS/IND, Bolling Air Force Base, Washington, D.C. CSP is an element of the Common User's Baseline for the Intelligence Community (CUBIC). CUBIC serves as a single source for computer systems designed to automate nearly all phases of intelligence data handling functions.

2.2 Summary of Capabilities

CSP can best be described as a collection of application and system level computer programs, designed to execute as a coordinated system, for the express purpose of store and forward operations on record copy message traffic. While there are many ancillary functions of CSP, its primary task consists of reception of message traffic, validation of proper format, and determination of required routing.

In and of itself, CSP is merely a message management system. Stripped of all ancillary processing, CSP is a system which reliably moves data from one point to another. It is this ancillary software, however, that defines the characteristics of the data being moved, and that operations are performed along the way.

Some of the basic functions and capabilities provided by CSP are listed below:

- o Mode I AUTODIN R/Y Interface
- o Mode II Interface Support
- o Variety of Interfaces and Protocols Supported
- o Input and Output Security Check
- o Message Format Validation
- o Message Journalization and Audit Trail
- o Message Review and Dissemination
- o Routing Line Segregation
- o Classification Stamping of Hardcopy Output
- o Message Edit/Generation
- o Output Message Logging

- Alternate Message Routing
- Online Message Retrieval
- Real-time Status Display
- DD Form 173 support
- Fully Automated Routing and Dissemination

2.3 Summary of Development Accomplishments

A detailed description of the work performed on each of the SOW items is presented in Section 3 of this technical report. This paragraph serves as a summary of these developments.

The work performed under improved transportability and operating system upgrade have both served to make the system more modular and more easily configurable. The two major common areas in CSP were made table driven and a third was restructured into a dynamic region to allow dynamic system reconfiguration. The system has been converted to object module distribution and the implementation of the dynamic system generation software will allow the CSP to be distributed in task image format.

Several new gateways were analyzed for incorporation into the CSP. This led to a refining of the gateway interface techniques to standardize new gateway implementations.

New capabilities were added to the system in the form of online message retrieval by several parameters, a full plain language addressing capability with DD Form 173 input from several sources, and the development of a Command Language Interpreter with an operator help facility to simplify operator input.

In addition to these developments, several analysis tasks were performed which looked at the feasibility of development of a Direct AUTODIN Interface in software to replace the TLC, and the feasibility of migrating to different hardware, including eliminating the BR1569 or BR1731 multiplexer. Another analysis focused on upgrading CSP to run under RSX 11M or RSX 11M+ as opposed to IAS, as well as the capability to utilize more of the IAS 3.1 features.

SECTION 3

3.0 Technical Performance

3.1 Advanced Capabilities Development

This category includes all SOW items which involve analysis or developments which are technical in nature. The result of each item was either the development of the actual capability or the publication of a technical report outlining what steps would be necessary to develop the capability.

3.1.1 Improved Transportability

This task involved work to facilitate the distribution, configuration, installation and subsequent support of the CSP system.

3.1.1.1 Objective

The objective of this task was to provide AFIS/IND with a baseline CSP system which is very well defined and can be easily distributed, configured, and installed at user sites; and which requires no programmer intervention to do so.

Three specific work items were identified to accomplish this objective. The first was conversion to a table driven architecture, allowing CSP to operate independently of those data structures which define its configuration. The second item dealt with developing software modules necessary to perform system configuration without programmer intervention. The last item involved distribution of the CSP software in task image, rather than source code.

3.1.1.2 Accomplishments

The work performed to satisfy the objective of this task is discussed in separate paragraphs below. Each paragraph relates to one of the work items discussed above.

3.1.1.2.1 Conversion to Table Driven Architecture

The two major system common areas, CSPCOM and QUECOM, were reorganized and consolidated to provide a single data structure dealing with system configuration and control. A programmers' reference manual was published to enable software developers to interface the new data structure. The CSP security common area was restructured into a dynamic memory region to permit dynamic configuration of this area.

3.1.1.2.2 SYSGEN Configuration

Software and an indirect command file were developed to allow the system manager to initially configure the CSP with respect to output queue definitions, communication lines definition, and system variable definitions within the data structure resulting from the consolidation of CSPCOM and QUECOM. The indirect command file allows

the system manager to create a data file for a full system configuration, perform full configuration, perform online modification of communications lines operating parameters, and obtain a configuration summary.

A software module and an indirect command file were developed to allow the system manager to define the contents of the CSP security table.

The indirect command files were developed to permit definition of configuration parameters in terms familiar to the system manager rather than a software developer. Explanatory comments can be requested to assist the manager in defining the system parameters and security information. Instructions in the use of these command files were published.

3.1.1.2.3 Task Image Distribution

This item was partially accomplished by configuring the CSP for object module distribution. All subsequent releases of Release 2.2 change 2 will be made in object module form only. A step-by-step flowchart for CSP installation, configuration, and acceptance testing was developed. However, these steps are only a milestone on the path to task image distribution. Implementation of the new CSP data structures and the configuration software will permit CSP distribution in task image format. These capabilities are being incorporated in the release 3 baseline under development.

3.1.1.3 Discussion

A great deal has been accomplished towards satisfying the objective of this task. The conversion to table driven architecture and development of software for performing system configuration and security table definition has brought CSP closer to the ultimate goal of task image distribution. Implementation of these capabilities will permit the CSP to be installed by executing command files to roll in software from a release tape and perform system configuration. This method of installation is similar to that of an operating system installation. The need for programmer intervention in the installation process will be eliminated. This will in turn free up contractor personnel for user training and system familiarization; as well as reducing the cost of installing the CSP system.

3.1.2 Site Unique Gateways

This task includes work required to improve and standardize the gateway interface techniques for CSP, as well as research and development of new gateways, as directed by RADC and AFIS/IND.

3.1.2.1 Objective

There were three basic objectives to this task. The first consisted of refining gateway interfacing techniques so as to facilitate new gateway implementation in a straight forward fashion. The advantages are clear: gateways could be designed, coded and implemented, totally independent of the baseline CSP from the standpoint of system modifications. The second goal was to build a "library" of gateways having various characteristics which could be used in new applications as either direct implementations or as providing a starting point for a new capability gateway which is not currently available. The third goal was to establish procedures and policies by which AFIS/IND could provide assistance to various organizations desiring to implement non-baseline or site-unique gateways. Such assistance would take the form of technical input and evaluation or outright assistance in programming efforts. Each goal has been met and specific discussion pertaining to accomplishments follows.

3.1.2.2 Accomplishments

3.1.2.2.1 Gateway Interface Modification

A substantial amount of work was performed in the area of refining gateway interface techniques. Perhaps the most significant accomplishment was to essentially complete the conversion of CSP to table driven architecture in the area of communications line identification and control. Prior to this work, a great deal of line characteristic information had to be coded into a gateway thus making it more complex and unique to that specific installation. While this did not adversely affect configuration of "standard" lines (such as the AUTODIN interface) wherein the parameters did not change from site to site, it definitely restricted flexibility and ease of installation where a particular site's requirements were slightly different from those for which the gateway was written. Having to make modifications for new sites necessitated full accreditation and presented a new set of variables for each site.

All line characteristics are now contained in a central table (CSPCOM) and need only be set up during installation. In conjunction with this change, gateways were modified to take advantage of these table parameters. The net result has been that the actual number of "baseline" gateways has been reduced and those that remain are simpler and more universal.

Another modification made was to recognize the actual gateway to CSP core interface mechanism. These routines (collectively referred to as the Message Control Subsystem, MCS) have been expanded in functionality and the access mechanism (MACRO calls) have been reduced in number and dramatically simplified. The new macro calls are closely patterned after the DEC standard file system calls (Files-11) such that any programmer reasonably familiar with Files-11 can easily understand and adapt the MCS calls.

This new software has not been incorporated into a released system as yet because to do so would require recoding of all existing gateways which is not cost effective. It is scheduled to be included in the next major release of CSP as an alternate set of routines to the existing MCS. Old gateways will continue to use the current MCS. Newly developed gateways will use the revised version and thus incorporation can be phased as necessary. All new gateways and any existing gateways requiring modification will use the new MCS routines.

3.1.2.2.2 New Gateway Evaluation

The work performed under this item consisted mainly of technical assistance provided to AFIS/IND and CUBIC (and non-CUBIC) users for the purpose of coordinating and evaluating new gateway installation. An early effort was the establishment of an interface control group which was tasked with development of an ICD for a general purpose high level protocol gateway for CSP. Preliminary work was performed but never completed unfortunately, due to higher priority tasking by AFIS/IND.

Assistance was rendered to developers of the OASIS installation of CSP (non-CUBIC) for their CSP-MAXI gateway utilizing the PCL11 hardware. Assistance and guidance was also given to TCATA for development of a CSP-CSP interface utilizing the DV11. Near the end of the contract period, assistance was provided to SAC for development of a transmit only DDCMP gateway utilizing DMC11 hardware.

3.1.2.3 Discussion

For the most part the accomplishments of this task were consistent with the initial goals. A foundation has been laid for subsequent new gateway development and experience has been gained in building new gateways and/or assisting others in doing the same.

The modifications to CSP have returned significant benefits. PDSC was able to design, code, and implement the Fully Automatic Routing Module (FARM) with very little modifications to CSP itself. In fact, the changes required to integrate FARM were global in nature and allowed integration of the Plain Language Addressing capability (PLA) with no changes whatsoever. FARM and PLA are not gateways of course, but they were interfaced in exactly the same manner. Additionally, the gateways actually written were interfaced with no CSP modifications but rather made using table entries.

This has resulted in another benefit. Work involving system configuration was made simpler and more automatic because it is now easy to pre-define table entries for all interfaces and thus allow configuration by question/answer sequences including those interface table entries specified by the installer.

3.1.3 Operating System Upgrade

3.1.3.1 Objective

The objective of this task was to include modifications to the CSP primarily oriented to the interface to, and use of, the operating system (IAS). As with most operating systems, new releases and enhancements are a continuing effort; IAS is no exception. This topic covers work needed to keep the CSP operable under the latest releases of IAS. This work is of an ongoing nature.

Four specific areas have been identified. relative to CSP improvements designed to take specific advantage of IAS enhancements.

3.1.3.2 Accomplishments

3.1.3.2.1 Expanded Use of Indirect MCR

The use of indirect command files were implemented for such processes as: rolling-in distribution tapes, installation and configuration, all aspects of the "build" process including single disk sites, all phases of system operation. Also included in this is the capability to build system security tables and system common areas. The advantages are clear through the use of indirect command files, there is little room for error. Repetitive type sequences may be executed faster and more reliably by inexperienced personnel, thus making the system easier to use.

The overall result of this work is that all CSP processes will be performed by question/answer sequences, thus eliminating the need for programmer intervention during these operations.

3.1.3.2.2 Development of a Command Language Interpreter

The development of a Command Language Interpreter (CLI) was successfully completed. The CLI was written specifically for the requirements of CSP thereby only recognizing CSP commands. This in effect will enforce the security of both CSP and IAS by means of only allowing commands that are permissible to CSP.

The CLI was written as a "user friendly" task. This is to say it will be easily operated by SSO personnel, due to the fact that a prompting sequence will ask for the need information in order to carry out a specific command. However if the entire command is completed at any given point no prompting will appear. This command structure will be easily learned due to this logic and simplicity, therefore training of new personnel will be less a problem than it currently is.

The CLI was written as a complete table driven routine using the IAS Table-Driven Parser (TPARS), designed to parse command lines. TPARS provides the means to define a unique syntax and, using TPARS-supplied macros, built-in variables, and coding provided by the

contractor, recognize a command line written in that syntax. With the above implementations, maintenance and future CSP expansions of commands are straightforward.

3.1.3.2.3 Development of an Operator "HELP" Facility

This task was intended as a comprehensive "HELP" facility for CSP. It was designed to work directly with the CLI for CSP. The help command displays information at the terminal to assist the operator in issuing further commands. Information is provided at three different levels: 1) A help command without parameters causes the names of all the available CSP commands to be listed. 2) A particular command name followed by the key word "HLP" causes the names of qualifiers and parameters to the command to be listed. 3) A particular command name followed by the key words "HLP EX" causes examples of the complete command line to be listed.

The operator may, at any point and time, type in the key word "HLP" or "HLP EX" and a full explanation or an example of the command in progress will be presented. followed by the repeated prompt.

This feature, coupled with the improved command structure, does a great deal to promote user acceptance and significantly reduce the amount of time needed for operators to gain proficiency in CSP use.

3.1.3.2.4 Future IAS Utilization

The operating system was upgraded from version 3.0 to version 3.1 and the CSP was upgraded to run under this executive. A technical report was provided. presenting the features of IAS and the impact of implementing RSX-11M+.

The potential features of the IAS operating system were identified and utilized to increase the efficiency of the CSP system, decrease its resource requirements and improve upon its functionality. The development of the Command Language Interpreter, development of the operator "HELP" facility, and the usage of indirect command files are all taking advantage of the operating system capabilities.

3.1.3 Discussion

The result of this effort is an overall improvement of the CSP in the areas of performance, maintenance and use, by taking advantage of the operating system capabilities.

3.1.4 Hardware/Software Analysis

3.1.4.1 Objective

Analyze the various evolution paths for CSP as related to hardware and software options. Provide the information necessary to evaluate the merits of the various hardware and software alternatives.

3.1.4.2 Accomplishments

Handlers were written to evaluate the DV11 and DUP11 as alternative OJ-389 interfaces. These handlers are the functional replacement for the BR1569 for OJ-389 support. The DUP11 handler is currently operational and in use at the Bellevue facility.

3.1.4.2.1 Hardware Analysis

Alternate communication devices were evaluated for possible use in a CSP system. The analysis included consideration of the DV11, DUP11, DP11, DZ11, DH11, DL11, COMM IOP-DZ, COMM IOP-DUP. DQ11, DMC11 and the KMC11-A as communication interfaces to be supported by CSP. The basis of much of this analysis was to determine whether or not the current CSP communication support could be provided by using DEC communication interfaces rather than those of another vendor. Evaluation has shown that DEC communications interfaces could be used for all of the current and foreseeable CSP interfaces.

Another area that was researched was the possibility of the implementation of a gateway to replace the TLC hardware in favor of a DEC interface. The evaluations performed here have indicated that this is very feasable, and could be accomplished using a DV11, DQ11, or even DUP11 as the supporting interface. The TLC could thus be totally eliminated.

Alternatives were studied for OJ-389 replacements using more conventional (and less expensive) terminals. The analysis has indicated that various approaches are viable, ranging from the 'dumb' terminal to the DEC Professional System desktop computers. All alternatives offer the advantages of being more cost effective and requiring less unique hardware.

CSP host systems were evaluated from the point of view of both the implementation of a 'mini CSP' and the expansion of capabilities of the 'maxi CSP' systems. CSP was implemented on the 11/24 at the Bellevue site. Other hardware alternatives for a CSP host that were evaluated ranged from the Micro T-11 based systems (primarily in a distributed processing envirnment) to the VAX systems (in conjunction with the implementation of a suitable HOL). Results have indicated that any PDP 11 family system with UNIBUS architecture could currently be used to host the CSP. The implementation of CSP in a HOL would open the range of possibilities beyond the PDP 11 family.

3.1.4.2.2 Software Analysis

A detailed analysis of RSX 11M and RSX 11M+ was performed to determine their suitability for support of the CSP. RSX 11M was found to be lacking in several key areas, but RSX 11M+ proved to be very suitable for CSP; in fact offers many implementation alternatives not currently available under IAS.

UNIVAC STEP-4 terminal software was evaluated and determined to be useful as a first step towards the development of a hardware independent terminal support subsystem.

Areas of software efficiency were addressed, and in many instances changes were implemented to improve the system performance. In most cases this involved the restructuring of modules to eliminate redundant coding and inter-task communications.

An analysis of HOLs was performed, and several languages including ADA, C, and FORTH were found to be capable of being used in an efficient manner to implement CSP.

3.1.4.3 Discussion

Hardware is currently available to allow the implementation of CSP using DEC communication interfaces only. This is advantageous from both an economic point of view, and a logistics point of view. A range of host systems is available in the PDP 11 family that allows the use of the newer processors (11/24, 11/34, and 11/44) to more closely match the requirements of small installations. Alternate approaches to the terminal support subsystem suggest the utilization of standard terminals rather that the OJ-389; this is feasable and could lower the cost of a small CSP system considerably.

IAS is going to be supported through 1985. It is currently a very stable operating system. But, if vendor support for new peripherals is to be available, an upgrade to a supported operating system would eventually have to be made. If the conversion of CSP to a HOL was deemed to be desirable, serious consideration should be given to the idea of remaining with IAS while the software is written in assembler, and upgrading to another operating system (possibly VMS on a VAX system) in conjunction with the HOL conversion. This would eliminate a great amount of effort necessary for the assembly language CSP conversion, which is not an immediate requirement. It would also result in the implementation of CSP in a HOL in a much more timely fashion.

3.1.5 Online Retrieval of Traffic

This task involved work performed to provide a message recall capability form the online message file disk.

3.1.5.1 Objective

The objective of this task was to develop software to allow the system operator to recover traffic from the current message file disk, based on a set of retrieval parameters. and reintroduce it to the system; thus making it available for retransmission and/or editing on the OJ-389 terminal. This capability was to include recovery of traffic without use of the history tape provided the traffic is still present on the message file disk.

3.1.5.2 Accomplishments

Work performed by the Informatics team consisted of integrating the SAC CSP message recall software into the CUBIC CSP baseline following its implementation at SAC and updating all CUBIC documentation to reflect its incorporation.

3.1.5.3 Discussion

The Informatics team considered several methods of implementing this capability. After consideration of the requirements of this capability, it was decided to await completion of the online message recall software under development at SAC, under a separate contract. The software being developed addressed all requirements defined for this capability. The Informatics team participated in the design review and software validation processes at SAC. Following government acceptance of the online retrieval software, the Informatics team incorporated the software into the CSP CUBIC baseline and updated the appropriate CSP documentation. The method of implementation chosen yielded significant benefits, most notably acquisition of this capability in a very cost-efficient and timely manner.

This capability has reduced the amount of time required to effect message retrieval. It allows recovery by a large set of parameters, ensuring that recall can be performed using communications center parameters, such as CDSN and OSRI/SSN, as well as user-supplied parameters, such as date-time-group. This capability has almost eliminated the need to perform message retrieval from history tapes, freeing operating personnel and the offline CSP system for other uses. Additionally, implementation of this capability has laid the groundwork for evolution of the CSP to a system which does not require magnetic tape archival storage.

3.1.6 Improved Message Alt-route Capability

3.1.6.1 Objective

This task provides enhancements to the existing CSP software which allows alternate routing of messages between selected output queues. Improvements will allow individual message alternate routing based on message OSRI, precedence, classification, routing indicator or assigned office symbol dissemination.

3.1.6.2 Accomplishments

Work was performed on this item under a separate contract at SAC. CUBIC tasking was to incorporate the completed software into the CUBIC/CSP baseline. Due to the delays encountered at SAC in implementing this software, the CUBIC integration could not be completed during this contract period.

3.1.6.3 Discussion

The improved message alt-route capability is now essentially completed at SAC, however, the final step of system checkout, test and integration is still to be completed. As soon as this phase is completed, the entire capability will be incorporated into the CSP baseline and made available to all CSP users.

3.1.7 Plain Language Addressing

3.1.7.1 Objective

Completion of this task resulted in installation of software allowing input message traffic to the CSP either in the format specified for DD Form 173, Joint Message Form, or as a fully formatted message from an "intelligent" OCR device.

3.1.7.2 Accomplishments

3.1.7.2.1 Analysis

An extensive Plain Language Addressing (PLA) analysis phase was performed which resulted in the preparation and publication of CDRL A012, PLA Analysis Report. This report examined two possible approaches which could be taken to provide a PLA capability to the CSP. Option one called for development of a smart OCR gateway which would accept input from an OCR after it fully formatted the DD Form 173 into the proper narrative format. This option would be relatively simple as it would only require a new gateway to a new type of device and would not require any changes to the core of the CSP. The second alternative called for development of the actual PLA software with the CSP, as well as an input gateway for a dumb OCR. This option would require extensive modifications to the CSP to accept a new format of message and perform all conversion and routing indicator assignments. The analysis report concluded with a recommendation to pursue option two and develop the PLA capability within the CSP itself. After publication of this report, the recommendation was adopted and the PLA development began on the CSP.

3.1.7.2.2 Development

The development phase of the PLA effort was begun by publishing a Subsystem Design Specification which outlines the functions, requirements, interfaces, and design details of each of the PLA modules. The PLA subsystem consists of four basic segments: the Optical Character Reader Gateway (OCRCON), the PLA Statistics Task (PLSTAT), the PLA Data Base Update Task (PLAUPD), and the main PLA Message Expansion (PLACON). PLACON is further divided into overlays consisting of a header validation segment, a message format line building segment, and a PLA to routing indicator conversion segment. The PLA data bases are structured as indexed sequential files created and maintained by RMS-11. This is a very powerful data base maintenance feature of the DEC IAS operating system.

The functions and capabilities of the PLA subsystem include validation of all DD Form 173 header fields, determination of DSSCS or GENSER community, conversion of all PLAs to routing indicators, processing of address indicator groups (AIGs) and DSSCS address groups (DAGs), exempting PLAs from AIGs and DAGs and prohibiting the transmission of the message to local addressees. If the message is

DSSCS, a check will be made to ensure the TCC of the message is allowed to be transmitted to each of the addressees. For GENSER messages, a proper transmission release code is assigned to any message containing foreign PLAs. The entire message is converted to the proper AUTODIN format, either DOI-103 or JANAP-128, sectioned and paginated if necessary and reintroduced into the CSP as a new message. As such, it is subjected to the full format check and finally sent to the supervisors review queue for release authorization prior to actual transmission to AUTODIN.

3.1.7.3 Discussion

The PLA capability was designed as a modular subsystem and may be implemented or omitted at any particular location. The memory requirements of PLA are such that it is not recommended to be implemented on a PDP 11/45 or any other CPU with only 128K memory. The disk requirements will vary widely from site to site depending on the size of the data base, however, on a normal message file disk, there is usually sufficient space available for this purpose.

The basic premise guiding the development of PLA was that the software would convert a DD Form 173 formatted message to the proper format, independent of the source of the DD 173. Therefore, it is not necessary to obtain an OCR scanner to benefit from the expansion capabilities of PLA. it is only necessary to supply the message in exact DD Form 173 format from any source such as directly from the OJ-389, or from a backside processor. In fact, the basic PLA software has been accredited for use in a DSSCS/GENSER environment with the primary input source of the OJ-389 and with no OCR.

3.1.8 Software Interface to AUTODIN

3.1.8.1 Objective

The current interface between the CSP and AUTODIN consists of a combination of hardware and software. The objective of this analysis was to present an analysis of possible interfaces that may be used as alternatives to the current interface between the CSP and AUTODIN. The primary objective of these alternate interfaces was to provide a direct interface to AUTODIN as opposed to the current interface which utilizes a pre-processor interface (TLC).

3.1.8.2 Accomplishments

A study was performed to carefully analyze the functions of the TLC, and the AUTODIN interface protocol. The hardware interface consists of a BA-1569 Multiplexer located in the AN/GYQ-21(V) system and an Analytics Teleprocessing Line Controller (TLC). The software interface is a non-privileged task, called the AUTODIN gateway (or TLCCON), that manages the transmission and reception of messages via multiple AUTODIN circuits. Each AUTODIN line is interfaced to a TLC through the BA-1569 Multiplexer to the host AN/GYQ-21(V). The results of the analysis showed that an interface to AUTODIN could be designed utilizing only standard DEC communications devices (eliminating the TLC). This analysis resulted in a technical report on the accomplishment of that task.

3.1.8.3 Discussion

The 'software TLC' is both feasable and desirable. The current TLCCON gateway should be updated to support the AUTODIN MODE I protocol in accordance with DCA circular 370-D195-3, and a handler developed for a suitable DEC communications device to support the link.

3.2 System Support

This category of work efforts involved work that was performed which is more service oriented than product oriented. The previous category dealt with actual software development and analysis tasks resulting in the publication of technical reports, whereas this section deals with intangibles. Items to be covered here consist of CSP installation, configuration management, quality assurance, computer programs and software maintenance activities.

3.2.1 CSP Installation Suppport

3.2.1.1 Objectives

Work performed for this task involved all aspects of CSP installation. Installation of the CSP consists of four well defined steps, each of which must be carefully and properly executed if the goal of successful installation and user acceptance is to be achieved.

3.2.1.2 Accomplishments

3.2.1.2.1 Site Surveys

A thorough site survey was the key to a successful CSP installation. This site survey was performed by Informatics personnel several months prior to the actual installation of the hardware or software. It was designed to accomplish two major objectives, to gather information and to provide information. Information needs to be gathered on all the site parameters such as routing indicators, office symbols, and security levels of the TCC and all the lines. Also, a complete hardware list needs to be obtained and the users requirements must be stated at this time. All this information was used to properly configure the CSP for installation at this particular site. The second phase consisted of providing information to the site managers concerning the capabilities and functions of CSP and matching these to their requirements. Assistance was provided to the site managers in selecting the proper hardware and software to meet their needs. Schedules, milestones, security aspects and operator preparedness was also discussed at this time.

During this period the following site surveys were performed:

- LANTCOM, Norfolk, Virginia
- FTD, Wright Patterson AFB, Ohio
- USAFE, Ramstein AFB, Germany
- ADCOM, Colorado Springs, Colorado
- REDCOM, MacDill AFB, Florida

- EUCOM, Stuttgart, Germany

- USAREUR, Heidelberg, Germany

- FSTC, Charlottesville, Virginia

3.2.1.2.2 Base Software Configuration

Once the site survey was completed and all the necessary information was gathered, the CSP was configured for the site prior to the actual installation at the user site. This consisted of defining the lines to be used at the site in CSPCOM, defining the output queues in the macro QUEUES, and defining for each queue the legal altroutes in the macro QUEOFF. Other parameters were also preconfigured if the total multiplexer channel assignment was known in advance. Base software configuration activities were conducted prior to installation of the CSP at LANTCOM, FTD, USAFE, ADCOM, and REDCOM.

3.2.1.2.3 Installation

Installation of the CSP is a two person effort with one person actually building the system and configuring all the site unique parameters, while the second person assists the user in preparation of all user maintainable tables, such as routing, dissemination, user ID, and security tables. These are functions which the user must be able to perform and it is critical that this function be successful. Once the system is installed, training of user personnel began immediately by one person, while the other person began a thorough system test in accordance with the CSP Installation, Test, and Site Acceptance Plan. During this contract period, CSP was installed at LANTCOM, FTD, USAFE, ADCOM, and REDCOM.

3.2.1.2.4 Site Unique Baseline

After a successful installation of CSP at each site, the system installation personnel gathered sufficient information about the configuration of the CSP that was just installed to enable the establishment of a site software and hardware inventory. This consisted of listing the modules containing all line and queue definitions and queue altroutes as well as the system generation command files which define the hardware configuration. Also, any software changes made at the site were noted and that software was transported back to Bellevue and incorporated into the CSP baseline where appropriate. Checksums were run against all software installed at the site, and these checksums were compared against a listing of CSP baseline checksums maintained in Bellevue. All this information was released to the configuration manager for incorporation into the Informatics Configuration Management System data base.

3.2.2 Configuration Management

3.2.2.1 Objectives

Configuration management is the application of systematic, technical and administrative procedures to identify and document the functional and physical characteristics of the CSP baseline modules as well as the site tailored software at each installation. Configuration management ensured adherence to well defined procedures for implementing additions or modifications to the CSP standard system and provided a mechanism for recording and reporting change processing and implementation status.

3.2.2.2 Accomplishments

3.2.2.2.1 Software Inventory

An accurate record of CSP software was maintained during this contract period with the aid of an automated Configuration Management System (CMS) developed at Informatics. With the use of this in-house tool, all CSP baseline software was identified and recorded.

3.2.2.2.2 Software Modifications Control

As CSP software updates were incorporated into the CSP, either as modifications to baseline or site-unique, they were logged into the CMS using a unique coding system. Using this coding system, it was possible not only to track the updated versions per baseline but to identify and record the site unique software modifications as well.

3.2.2.2.3 Software Modification Distribution

As new or updated CSP modules were released and distributed, the configuration management system played an essential part in maintaining records of the releases. Using a site subsystem in the automated system, a record of the most current CSP release per site, was maintained.

3.2.2.2.4 Site Configuration Support

The CMS supported each site configuration by maintaining a site inventory. This included for each site the current CSP release, the date of installation and any site unique software.

3.2.2.3 Discussion

Informatics has developed, as an in-house tool, an automated configuration management system to aid in the identification and maintainance of all CSP software. This tool has been a valuable asset by providing an accurate record of changes within the CSP for the past two years. It reflects the software inventory, software modifications, problem logging, CSP documentation and site inventory and has proved to be an instrumental aid in ensuring the integrity of the CSP.

3.2.3 Software Quality Assurance

3.2.3.1 Objective

The Software Quality Assurance task was implemented to monitor and control the quality of the software being developed, assure that software delivered under this contract complied with the requirements of this contract, and to guarantee that the CSP software was developed, tested and maintained in an effective and efficient manner.

3.2.3.2 Accomplishments

Early in the contract period the Software Quality Assurance Program was established. Procedures were established for work tasking and authorization, testing, corrective action, library controls, documentation preparation, software reviews, and software development techniques and methodologies. Throughout the contract period the enforcement of these standards has contributed immeasurably to the development of consistently high quality, and thouroughly tested CSP software.

3.2.3.2.1 Plan Preparation

The Software Quality Assurance Plan was prepared according to the guidelines provided in MIL-STD-1521, Technical Review and Audits and DOD Standard 7935.1-S, DOD Automated Data Systems Documentation Standards. Particular attention was given to a practical implementation of a plan that could be implemented in a manner that would assure that the software would be of the highest possible quality.

3.2.3.2.2 SQA Activities

Although the SQA philosophy is constantly present, it was particularly evident in the implementation of a new CSP baseline. This often involved major changes to the software to incorporate new features and enhancements. Thorough testing and certification was promoted by the SQA implementation guidelines (CSP Software Quality Assurance Program TR-80-2550-04, May 1981). Baseline testing and verification procedures followed the guidelines established in the CSP Installation, Test and Site Acceptance Plan, which describes in detail the site preparation, system generation, site operational tables, training and security accreditation. The Software Quality Assurance Program activities were a portion of every phase of CSP software development, testing, implementation, training, accreditation, and site acceptance.

3.2.4 Computer Program

3.2.4.1 Objective

All computer programs assembled or developed under this contract were delivered in the form of source and object code on magnetic tape, and accompanied by source listings. Assembly language was used. The goal of this task was to ensure that the most current version of all CSP software is delivered to AFIS/IND for distribution within the prescribed procedures.

3.2.4.2 Accomplishments

Since AFIS/IND does not currently have a computer facility or the capability of maintaining the baseline and distributing the CSP software to the user sites, this baseline has been maintained by Informatics at their Bellevue, Nebraska development facility. As modifications were made to any CSP software module, they were thoroughly tested before incorporation into the baseline. Distribution was made to the user sites via an update tape containing the changes into the user's system. Initially, all changes were distributed in source form and the system had to be reassembled and retaskbuilt after each change. However, the system migrated to the point where it could be distributed in object format for the majority of the modules. Thus CSP is now installed in object form and all modifications are also in object module form where appropriate. The only source code supplied to the site are those modules that are required to reconfigure the system tables and site unique parameters.

3.2.4.3 Discussion

As the computer facility is completed at AFIS/IND the CSP baseline software will be transferred to that facility and maintained there. This will consist of all sources and object modules. From there, object module distribution will be made as it is currently done at Bellevue. Any modifications made to the CSP will be thoroughly tested and the source code will be shipped to AFIS to update the baseline.

3.2.5 Software Maintenance

3.2.5.1 Objective

Software maintenance included all work providing for centralized maintenance support to all CUBIC sites. This support took the form of CSP problem identification and resolution, as well as CSP enhancements. Problems were identified by the CSP on-site personnel and resolved by project personnel at the Bellevue development facility.

3.2.5.2 Accomplishments

Over the two year period of the CSP contract, several major accomplishments were made in correcting and enhancing the CSP contract. As mentioned above, these accomplishments included problem resolution, as well as CSP enhancements. CSP corrections were made in three steps: problem identification, problem resolution, and problem response. Each separate process was activated when needed. Each area is discussed below. Enhancements included suggestions from AFIS/IND, as well as the CSP on-site personnel. General maintenance support was also performed at the Bellevue development facility.

3.2.5.2.1 Problem Identification

Problem identification was an important aspect of software modification. For the CUBIC CSP contract, problem identification took two forms: full-time, on-site support or centralized off-site support from the Bellevue development facility.

Generally, problem identification began with recognition of a CSP malfunction, attributable to software, by operators or user personnel at a CSP installation. AFIS/IND was informed of this malfunction by the issuance of a user report from the CSP site where the error occurred. After AFIS/IND had validated the problem report, Informatics was notified of the problem and began to diagnose it. Any site specific modifications which did not require AFIS/IND approval were corrected on-site and the changes communicated to the Bellevue office.

3.2.5.2.2 Problem Resolution

Once the Bellevue development facility received the problem report from AFIS, the process of problem resolution began. If necessary, phone conversations with the appropriate on-site personnel were conducted, in order to clarify the nature of the problem. This was followed by an extensive analysis of the software malfunction. Many times this analysis would indicate that an actual software error had not occurred; the malfunction could be traced to some other site occurrance.

If the problem was determined to be a software error, the required corrective action was determined and the resulting maintenance task was sized and scheduled. AFIS/IND was then given necessary information as

to the diagnosis results and scheduled corrections. Under the terms of the contract, this notification occurred within five days of receipt of the probem report.

3.2.5.2.3 Problem Response

Once AFIS/IND had been informed of the status of the software error, Informatics kept them up to date via the monthly status report. All software malfunctions were identified as either 'open' or 'closed'.

Once the changes were made and successfully tested at the Bellevue facility, distribution was made to the appropriate installation. Depending on the time demands on the problem, distribution was made either immediately or at a convenient time, such as the shipping of a site release tape.

3.2.5.4 General Maintenance Support

Along with problem identification, resolution, and response, general maintenance support occured at the Bellevue development facility. This support included implementation of new CSP releases; working with on-site user and operator personnel to investigate CSP malfunctions; and analyzing, planning, designing, coding, testing, installing, and documenting site unique software modifications. All these software modifications were designed, developed, tested, and implemented in accordance with CSP quality assurance and configuration management guidelines. This general maintenance support served as an enhancement to CSP functionality.

3.2.5.3 Discussion

For the most part, software maintenance functioned during the course of the CUBIC CSP contract as described above. There was, however, one important change in software maintenance. In January of 1982, AFIS published guidelines for use of standard Cubic Problem Reports (CPRs). These reports provided a method for identifying all CSP errors on a numerical system, by site, as well as in sequential order. In addition to identifying CSP software errors in a more efficient fashion, the CPR system also provided for accurate record keeping of all suggestions/enhancements for the CSP. These suggestions and enhancements were reviewed by AFIS and Informatics and, if deemed appropriate, were acted upon.

3.3 On-Site Maintenance

On-site maintenance of the baseline, enhancements, and site unique software was provided as a site option. This included analyzing, planning, designing, coding, testing, installing, and documenting site unique software. Also included was providing familiarization to selected operators and programmer/analysts; identifying, analyzing, reporting and/or resolving software problems or enhancements; and providing assistance to the operating agency on the integration, installation and implementation of new CSP hardware/software. Each site currently receiving on-site support is discussed below. Appendix A contains additional information on each site at which CSP is installed.

3.3.1 TCATA, Ft. Hood, Texas

On-site support was initiated during the month of June, 1981 at TCATA. A new gateway was created at TCATA which utilizes a dynamic region to pass messages between the CSP and the TCATA Output Message Controller and Timer (TOMCAT). An interface was also developed between the CSP and the Battlefield Evaluation and Target Acquisition (BETA) system. A third gateway was designed to allow CSP-CSP communications over a satellite link to allow for the deployment of the Remote Communications Processor (RCP). This gateway operates through a DEC DV11 multiplexer. Several joint exercises were supported by CSP and the on-site personnel during this contract period. No significant problems were encountered with CSP support during any of the exercises in which CSP participated.

3.3.2 MAC, Scott AFB, Illinois

On-site support was initiated during the month of June, 1981 at MAC also. MAC is operating under a unique hardware configuration with both the CSP tasks and the message file on a single disk. This does not require any special software to support this arrangement, however, the on-site support representative is needed to keep the system operational under this configuration. Any time the system pack gets corrupted due to hardware failure, it is necessary to cold start the system since the message file is coresident. This arrangement has not appeared to hamper on-line operations except for the frequent degradation of the ability to recover messages on-line from the message file after a cold start. Recently, several problems have been encountered causing the system to hang up and occasionally causing a system crash with a memory parity error. This has necessitated the removal of CSP release 2.2 change 2 and the fall-back to change 1. Change 2 will be reinstalled when the system is moved to the PDP 11/45s recently obtained by MAC and the hardware problems can be eliminated.

3.3.3 USAFE, Ramstein AFB, Germany

On-site support was begun at USAFE during the month of August, 1981. A modification to the TLC gateway was made at USAFE which alternates use of the two AUTODIN communications lines to allow more

equitable use of the dual-homed capability of the CSP. This modification was incorporated into the baseline and was redistributed to other CSP sites. A problem was identified and resolved concerning the BR1569/TLC interface. A unique problem was discovered at USAFE regarding the 50HZ power supply and its unstable effect on the system time. They were experiencing a frequent loss of time from the system clock, which prompted the on-site representative to modify CSP to allow a change of time online. Another unique problem found relates to releasability of messages to non-US personnel. In particular, TOPSECRET messages should be allowed to be released to certain countries based on the routing indicator and SPECAT designator. The solution is currently being analyzed and a modification will be made to CSP to allow release of these messages.

3.3.4 LANTCOM, Norfolk, Virginia

On-site support was initiated during the month of September, 1981 at LANTCOM. The unique use of Teletype Model 40 printers as Baudot messages and service printer devices caused a new printer handler to be developed to handle formfeeds and printer timeout conditions. Another requirement was initiated at LANTCOM which called for processing multiple action addressees. This capability was developed for LANTCOM, but has become part of the CSP baseline capabilities. A problem surfaced at LANTCOM regarding the handling of CRITIC messages, specifically the rigid format validation performed by CSP and the possible rejection of the message due to format errors. LANTCOM proposed to bypass format validation of CRITIC messages providing that format lines 2 and 16 were correct and could therefore identify the message as a CRITIC. The change was made by site personnel at LANTCOM without coordinating the change with AFIS or the proper office in DIA. A meeting was set up between AFIS, DIA, LANTCOM, and Informatics personnel and a proper solution was agreed upon by all parties. The solution to the problem is being designed and will be implemented in a standard manner, to replace the fix at LANTCOM.

3.3.5 ADCOM, Colorado Springs, Colorado

On-site support was begun at ADCOM during the month of January, 1982. The actual installation of the CSP, however, did not occur until mid-August 1982, due to facility construction delays. After installation an attempt was made to perform system accreditation testing, which failed due to several factors, including incomplete wiring, wrong signal level at the Western Union J-Box, lack of support at the ASC, and untrained operators. These problems were resolved by mid-October and accreditation retesting occurred, this time successfully. The problems remaining at ADCOM are in the redundant channel configuration of the BR1731 multiplexer and the NSA circuit configuration through the BR1731.

3.3.6 REDCOM, MacDill AFB, Florida

On-site support was initiated at REDCOM during the month of April, 1982. The hardware was installed and the BR1731 was only configured with a capability to support a Model 40 receive only printer. Since full duplex communications were required to support the RDJTF facility, modifications were made to the Mode II input gateway to support input of messages through the teletype handler.

3.3.7 SAC, Offutt AFB, Nebraska

On-site support was initiated at SAC under this contract during the month of April, 1982. Actual on-site support was provided at SAC from the time of the original installation in 1978, however, this support was provided under a separate contract to SAC. In April, the separate SAC contract was terminated and SAC became a formal CUBIC/CSP user. Because of its proximity to the Informatics development facility, much of the support provided to SAC consists of implementing new software and running a thorough test and evaluation prior to actual incorporation into the CSP baseline. In this manner, SAC has been designated the lead command for all CSP developments.

3.4 CDRLs

The following CSP documents were successfully completed and delivered during the contract period.

3.4.1 CSP Status Report (CDRL A001)

The CSP Contract Status Report was issued monthly and identified the status and activities for all tasks in progress in terms of performance, status, and work planned for the next reporting period. Additional sections were included that identified management items of concern, a management level work summary, all CSP contract related travel, and changes in project personnel.

3.4.2 CSP Overview (CDRL A002)

The CSP Overview provided an overview of system objectives and requirements suitable for management and general informational purposes. It was prepared in accordance with Data Item Description No. R&D-188-RADC.

3.4.3 Functional Requirements Manual (CDRL A003)

The Functional Requirements Manual provided a description of common system capabilities which were used to describe the system to potential users, to preview the system when training user personnel, to serve as a reference for user personnel, and to provide a performance checklist after installation. Because this document was used by staff who did not necessarily have computer system experience, it was written using language which was as nontechnical as possible. It was prepared in accordance with Data Item Description No. R&D-189-RADC.

3.4.4 System Design Specifications (CDRL A004)

The System Design Specification provided a detailed definition of CSP functions and interfaces with other system and subsystems. It was in accordance with Data Item Description No. R&D-190-RADC.

3.4.5 System Operator's Manual (CDRL A005)

The CSP Operator's Manual contained complete detailed information on the system console, MDC/SVC terminal, and offline and support procedures necessary to successfully operate the automated support system. It was oriented towards computer operators and message distribution personnel who were responsible for the efficient performance of the CSP, and included appendices covering system error messages, distribution terminal error messages, and system commands. Additionally, a separate appendix was prepared for each site which contained a configuration summary and other information unique to that site. Each site received the general Operators Manual along with the appropriate site configuration appendix generated as a result of the installation process of the particular system.

The manual was prepared in accordance with Data Item Description No. R&D-191-RADC.

3.4.6 Program Maintenance Manual (CRDL A006)

The CSP Maintenance Manual presented detailed program descriptions for all CSP modules and information on the maintenance of these modules. It was technical in nature and was developed for personnel who were responsible for the maintenance of computer programs. This document, together with a program listing containing programmer comments, assisted the maintenance programmer in making modifications to the existing system programs as requirements changed.

3.4.7 Configuration Management Plan (CDRL A007)

The CSP Configuration Management Plan (CMP) specified procedures for the achievement of the CUBIC CMP configuration management goals for the subset of all CSP software developed, disseminated and/or maintained by Informatics General Corporation under the CUBIC Management Program.

3.4.8 Test and Implementation Plan (CDRL A008)

The T&I Plan provided guidance for management and technical efforts throughout the installation, test and training period for each installation. The T&I Plan detailed procedures for initial software installation and subsequent releases. It also established a comprehensive test plan so that users and security personnel could demonstrate and validate the operational capabilities of the CSP. By defining and publishing such a benchmark, against which the system could be made to perform, the process of DIA/DCA certification could be made simpler, and more standardized for the user, while at the same time providing DIA/DCA with a well defined procedure and published, expected results.

A second major aspect of the T&I Plan was a detailed checklist for installation and user orientation/training. This checklist was used by the Informatics installation team to ensure that all phases of CSP installation were properly and effectively performed. In it were detailed key points and milestones relative to installation as well as specific items of a user training nature which must be covered to ensure proper user preparation.

3.4.9 Test Analysis Report (CDRL A009)

The Test Analysis Report was produced by the Informatics team following accreditation testing of the CSP for new installations or new releases of CSP software. These reports consisted of a synopsis of test activities including a description of any problems encountered.

3.4.10 Operating System Upgrade Interim Technical Report (CDRL A010)

The Operating System Upgrade Interim Technical Report contained results of an analysis of potential for use of specified IAS features.

3.4.11 Hardware/Software Alternatives Interim Technical Report (CDRL A011)

Two reports were produced as part of this contract deliverable. The first consisted of a report identifying a set of generic hardware configurations which can support the CSP and associated system capabilities. The second report addressed the capability to make certain software modifications related to a scaled down hardware version of the CSP.

3.4.12 Plain Language Addressing (PLA) Interim Technical Report (CDRL A012)

The PLA Interim Technical Report consisted of the results of an analysis of two possible approaches which may be taken to provide a CSP capability for PLA.

3.4.13 Software Interface to AUTODIN Interim Techncial Report (CDRL A013)

The Technical Report for the feasibility of a direct software interface to an AUTODIN Switching Center (ASC) included results of an analysis effort projecting impacts on memory utilization, throughput, efficiency, and security accreditation.

3.4.14 Final Technical Report (CDRL A014)

This Final Technical Report (FTR) for the CSP Support contract summarizes the results of work performed during the contract period. This report identifies CSP capabilities and deliverable products that were produced.

3.4.15 Quality Program Plan (CDRL A015)

This document identified requirements and procedures for a Software Quality Assurance Program that were implemented for the CSP Support Contract. The Quality Program Plan was produced in accordance with MIL-S-52779 guidelines.

SECTION 4

4.0 Summary and Recommendations

Reviewing the accomplishments of this past contract reveals that many tangible improvements have been made to CSP which brings more productivity into the telecommunications center. Without a doubt, FARM and PLA significantly broaden the applicability of CSP and have gained strong user attention and anticipation. Prior to these was online message recall which has all but eliminated the need for magnetic tape. Another visible improvement has been the modifications designed for flexibility and transportability. The CSP software can be installed, configured and made test ready in under half a day and be done in a fashion which provides complete audit trail and configuration management information.

From a functionality standpoint, it can be seen from the above that significant improvements have been made to the CSP. To the aforementioned list could be added numerous other improvements of a lesser nature, but nonetheless supporting the evolution of CSP from a relatively primitive communications processor to an automated full function communications system.

Throughout this evolution the design and implementation process has included considerable thought toward anticipation of future requirements. For example, while the PLA capability was not scheduled for completion until late 1982, the foundation for PLA, in terms of data structure modifications and other "hooks", was laid as far back as 1980. This has allowed integration with virtually no impact anticipated on existing installations when upgrading to PLA. Release 2.3 of CSP will include, of course, PLA, FARM and many other enhancements, but it will also include "hooks" for future anticipated expansion. In terms of SOW items for the follow-on contract, several changes have been anticipated and the foundations laid for upgrading CSP to RSX-11M or M+, running CSP on a smaller hardware configuration, elimination of the History/Intercept tape requirement, message recall by service message request, and modifications to the MDC terminal operations.

CSP has been evolving along other lines besides functionality. The original CSP for SAC was fairly restrictive as to the hardware configuration it required for operation. For instance, usage of other than DEC TU10 tape drives for history and intercept required software changes. Today CSP is much less restrictive as to hardware requirements. With consideration given to performance and capacity requirements, CSP can be offered as a system able to run on the entire family of PDP-11 processors (except for 11/23 and 11/24 because of IAS operating system constraints). CSP can use as a message file data base any disk drive supported by the operating system and the same holds true for mag-tape devices. Because CSP was designed for device independence, it can take immediate advantage of new peripheral offerings as soon as they become available with operating system support.

With the advances in hardware/software technology projected to proceed at their current phenomenal rate, it will not be long before the current CSP hardware/software architecture will be updated with respect to available technology.

From a hardware standpoint the industry move is, and always has been, to more processing power in smaller packages. Much more emphasis is being place on distributed processing techniques in an effort to expand the capabilities of these smaller processors, as well as limit the reliance on a single processor for all functions. The other obvious use of distributed processing is to get more capabilities to more people.

Software, too, is undergoing a change in terms of how people view its use. With the current evolution of higher order languages (HOLs), the frequency of machine language (MACRO-11, BAL, etc.) implementations of computer programs will drop dramatically as more powerful and flexible HOLs become available. Machine language has historically been selected for use becuase of its efficiency and ability to manipulate the hardware and small units of data (bits, bytes, etc). It was also, in many cases, the only language available on minicomputers in the early stages of development. This is rapidly changing, however and the time is not far off when machine language will be a tool used only by the hardware designer when building the machine itself. Consider the DEC VAX 11/780 which implements sophisticated data structure manipulation operations in its instruction set, or the Commerical Instruction Set (CIS) option for the PDP-11/24 and 11/44. Many microprocessors are commercially available which offer the PASCAL, BASIC, and "C" languages implemented in firmware, and which cannot easily be programmed in machine language. A major drawback to machine language has been and, by definition, will continue to be, cost. While it is generally efficient in its operational form, the cost to develop continues to escalate as labor costs rise. Machine language programmers are hard to find and good ones demand high salaries. The efficiency of machine language is directly dependent upon programmer expertise while with higher order languages a large amount of efficiency can be "built in" to the compiler and the language itself. Another drawback to machine language is dependancy. For example, software coded in PDP MACRO-11 cannot be executed on anything but a PDP-11. This is not necessarily true of HOLs. A program written in "C", PASCAL, or ADA will run on a variety of computers supporting that language.

Where does this all fit with CSP? One can begin by looking at the user. Telecommunications centers serve a vital but relatively minor role in the process of intelligence information gathering and dissemination. The message traffic itself is merely data until it gets into the hands of the intended recipient where its true value comes into play. Many of the processes taking place in a communications center require significant manpower allocation but represent minor capabilities for computer systems. As these TCC processes are translated into software, less effort need be expended on moving data and more can be spent on using it.

Most communication centers have limited space and in most cases that space must be shared between people, communications equipment, administrative offices etc, and finding room for two PDP-11/70 systems can be a problem. It is therefore incumbent upon system designers to provide more compact and efficient systems which get the job done but do not have the impact on space of the current larger systems. Coupled with smaller size and increased performance is a constant requirement to reduce costs, both in hardware procurement/operation and in software development and maintenance.

Cost reduction and performance improvement can be accomplished through use of newer, smaller, more powerful equipment including distributed processing techniques and through other techniques such as software preparation in a suitable higher order language such as ADA. The result will be a very efficient (in cost, space and performance) system with wide flexibility and applicability.

To a certain extent CSP stands at a crossroads with respect to future evolution. In its current state CSP is a solid, well defined system. If TCC requirements were never to change and currently used hardware continued to be available, then CSP could continue to be a viable system. Neither of the above premises are true however and some decisions must now be made concerning the evolution path to take. No single path represents a clear-cut decision. On one hand there is strong support for migration of CSP to smaller hardware which would give the same or slightly more capability than the current system. This makes sense from the standpoint that the hardware is moving in that direction and TCC's don't usually have physical space to spare. On the other hand, changing TCC requirements such as consolidation of DSSCS/GENSER facilities as well as overall expansion of communication requirements tends to support the move of CSP to larger. faster hardware. In its current form and using current 21(V) hardware. CSP is throughput limited to perhaps 6000-8000 messages/day. This is adequate for most applications but clearly inadequate for many potential users.

It is, of course, a well known fact that DOD is pursuing a solution to the current AUTODIN/Tributary problem, and this is the Inter-Service AMPE, CSP is the interim standard AMPE and as such is scheduled to be replaced by I/S AMPE, or is it? Even though I/S AMPE would automate TCC's as well as serve as switching nodes for the DIN network, does that eliminate the requirement for message processing systems connected to I/S AMPE? Today CSP provides 70% of the functionality projected for I/S AMPE and rough estimates for I/S AMPE operation are for the late 1980's; CSP will have to provide service until then.

The work items identified in the follow-on contract represent some real direction in this decision making process. Conversion of CSP to a higher order language is an absolute necessity. It must be pursued with serious dedication. ADA represents the clear-cut choice of languages. Lack of approved compilers is a temporary problem, but it is anticipated

that very shortly the computer manufacturers will begin to make available ADA compilers along with the necessary development environment tools. The problem of hardware dependence must be resolved. This will in fact be partially alleviated by conversion to a HOL but more work must be done in order to use standard, vendor supplied options and thus remove the reliance on unique (expensive) sole source equipment.

For CSP the past two years of work saw the overall organization and stabilization of the system into a well defined product. New capability was added in a methodical and well planned fashion. With respect to functionality, CSP is now mature. The work to be performed over the next several years must focus on evolution towards refinement of the technology and expansion of applicability and flexibility.

APPENDIX A

CURRENT CSP INSTALLATIONS

HQ SAC, Offutt AFB, Nebraska

Site Location

The CSP became operational at HQ Strategic Air Command (SAC) in September 1978. The CSP was developed at HQ SAC as part of the Operational Intelligence Support System (OISS) of the IDH Improvements Project.

SAC has a world-wide mission of deterring war by being prepared to conduct strategic operations on a global basis with the objective of destroying an enemy's will or capability to wage war.

CSP provides both DSSCS and GENSER communications support for transmission and reception of real-time AUTODIN messages in support of SAC's mission. In addition, the CSP functions as a front-end processor for the Analyst Support Processor (ASP), which directly supports SAC's intelligence analysts.

Equipment Configuration

The CSP at SAC is currently implemented on the following hardware for the primary system:

- CPU - One (1) PDP-11/70 with 256K memory
- System console - One (1) LA120 DECwriter
- Disk drives - Three (3) BR1538D (shared)
One (1) RL01
- Tape drives - Two (2) TE16
Three (3) TU10 (shared)
- Multiplexer - One (1) 36-channel BR1569
- Line printers - One (1) LP11WA (shared)
One (1) B600
One (1) TT Mod-40 ROP (shared)
- AUTODIN Interface Device - Two (2) TLC100 (shared)
- Message Distribution Console - Three (3) OJ-389 (shared)
- Other Equipment - One (1) VT52 terminal
One (1) paper tape reader/punch
One (1) CR11 card reader (shared)

The backup system is configured identically to the primary. Those items listed as "shared" above are switchable between the two processors. Additionally, individual circuits terminating in the BR1569 multiplexer are switchable between both processors by means of BR1568 switches.

Software Configuration

Figure A-01 contains a site report extracted from Informatics' Configuration Management System. This report reflects the current software release level for this site, the date of software installation and implementation, and a status of pending releases. Also included are any site unique modules developed for this particular site.

Communications Configuration

The CSP is dual-homed to Tinker and Gentile ASCs for online tributary operations, both DSSCS and GENSER. Backside tributaries at SAC includes the ASP, Mode II send and receive circuits, and a SPCL processor for delivery to SOLARS.

A connectivity diagram for SAC is presented in Figure A-02.

Current Operations Statistics

SAC's average traffic volume and CIM rate are as follows:

- o Messages transmitted - 1569 per month
- o Line blocks transmitted - 112,086 per month
- o Messages received - 56,301 per month
- o Line blocks received - 1,421,982 per month
- o CIM Rate - .57%

The CSP is able to maintain approximately 37 days of online storage. SAC has been able to maintain a low CIM rate due to the extensive format and security checks performed by the CSP.

Approximately 75% of the incoming messages are derivatively routed to the ASP. Another 5-7% are derivatively routed to the SPCL system. Approximately 5% of the incoming messages are derivatively routed to the SRC. The remainder of the incoming messages is routed by the message distribution clerk.

The station reliability for SAC including both hardware and software outages is approximately 99.64%.

Future Operations

There are plans to replace the interface to the SPCL system with an interface to the SAC SOLARS system via the Micro-Programmable Controller (MPC). When this interface is complete, the amount of messages derivatively routed to SOLARS is expected to increase by approximately 3%.

SITE: SAC (SA)

RELEASE: 2.2C2

STATUS: OPERATIONAL 30-APR-82

DATE OF INSTALLATION: 30-APR-82

REMARKS: NONE

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UNIQUE MODULES:

MODULES: INTCON.MAC
IDENT: V2.2SA1
DESCRIPTION:
INTCON WAS CHANGED TO SUPPORT THE CHANGES MADE TO 'INTGWY.MAC' OF THE SAME LEVEL. EFFECTIVELY THE ASCII LINE NAME IS CONVERTED BACK TO ITS ASSOCIATED LINE ID BEFORE ENTERING CSP. THIS CHANGE WILL ALLOW THE OPERATOR TO ENTER INTERCEPT TAPE INFORMATION BETWEEN CSP RELEASES.

MODULES: INTGWY.MAC
IDENT: V2.2SA1
DESCRIPTION:
THE "PADWRITE" ROUTINE OF INTGWY.MAC WAS EXPANDED TO ALLOW A CONVERSION OF THE LINE-ID TO ITS ASSOCIATED ASCII LINE NAME BEFORE WRITING THE PAD TO TAPE. THIS CHANGE WILL ALLOW OPERATOR TO ENTER THE INTERCEPT TAPE INFORMATION BETWEEN CSP RELEASES.

Figure A-01 SAC Configuration Status

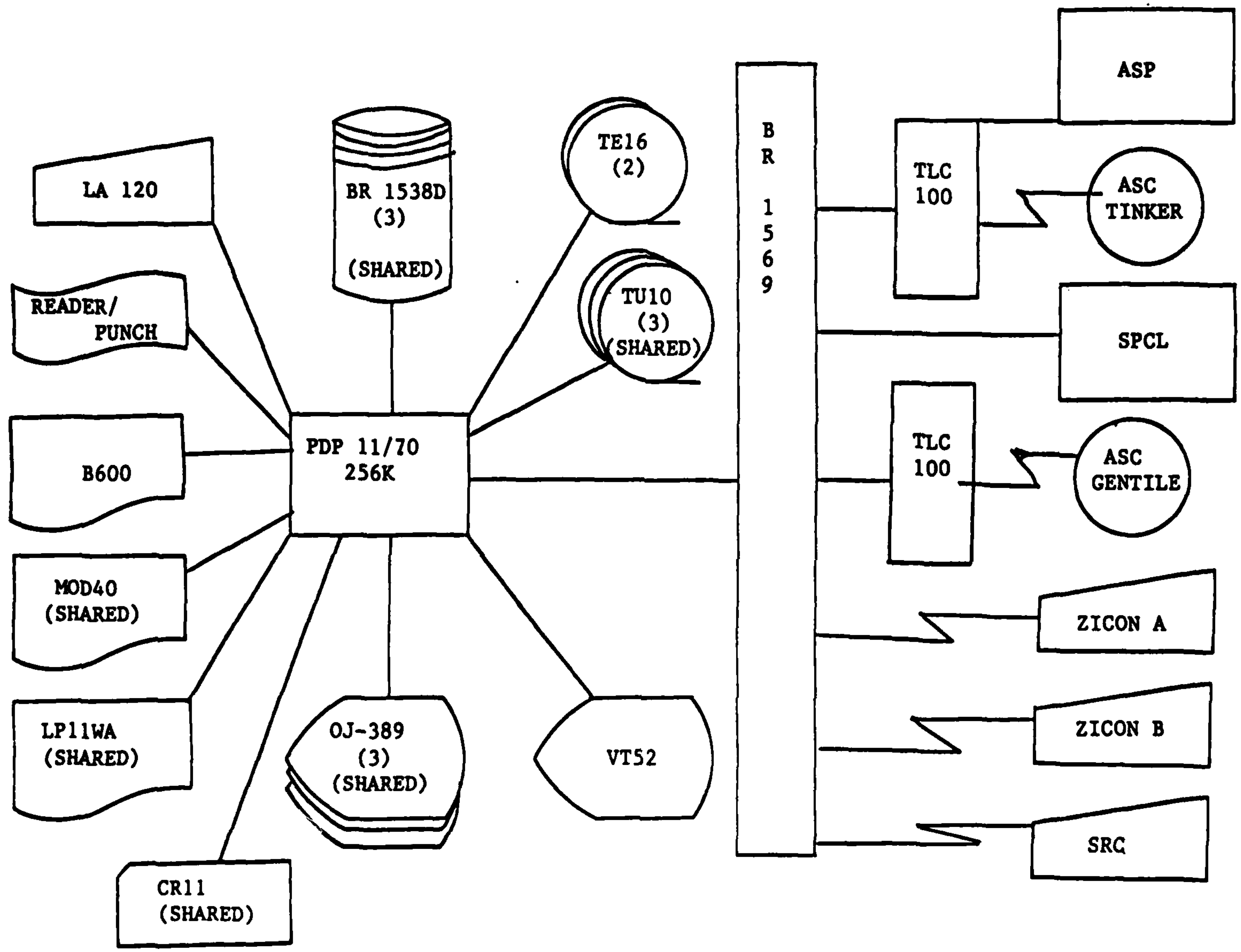

Figure A-02 SAC Connectivity Diagram

Site Personnel

There are no CUBIC/CSP on-site representatives per se at SAC. The close proximity of the Bellevue facility to SAC makes it possible for the personnel at the contractor's facility to assist in system trouble shooting. This effort is conducted largely by Mr. Bob Mack, Informatics and Mr. Barry King, PRC. Messrs. Mack and King work closely with the communications and data processing staffs of SAC. Their primary point of contact is 1st Aerospace Communications Group.

HQ MAC, Scott AFB, Illinois

Site Location

CSP was installed at HQ Military Airlift Command (MAC) in June 1979. This was the second installation of CSP after SAC successfully demonstrated the ability of the CSP to the military intelligence community.

MAC has a world-wide mission of providing airlift, logistic, supply and transport support to all DOD elements. A secondary mission consists of supporting Air Force Communications Command, Air Rescue and Recovery Service and Air Weather Service components.

CSP provides both DSSCS and GENSER communications support for transmission and reception of real-time AUTODIN messages in support of MAC's mission. In addition, the CSP functions as a front-end processor for the MAXI system, which directly supports MAC's intelligence analysts.

Equipment Configuration

The CSP at MAC is currently implemented on the following hardware for the primary system:

- CPU - One (1) PDP 11/70 with 128K memory
- System Console - One (1) LA36 DECwriter
- Disk Drives - One (1) BR1538D
- Tape Drives - Three (3) TU16
- Multiplexer - One (1) 36 channel BR1569
- Line Printers - Two (2) 80 character line printers
- AUTODIN Interface Device - One (1) TLC100
- Message Distribution Console - Two (2) OJ-389
- Other equipment - One (1) VT52 terminal
One (1) Paper tape reader/punch

There is currently no backup processor to be used in the event the PDP 11/70 or one of its peripherals is down. If the down-time is excessive, a PDP 11/70 used to support MAXI can be recabled to run CSP.

Software Configuration

Figure A-03 contains a site report extracted from Informatics Configuration Management System. This report reflects the current software release level for this site, the date of software installation and implementation and a status of pending releases. Also included are any site-unique modules developed for this particular site.

Communications Configuration

The CSP is homed to ASC Gentile for online operations, both DSSCS and GENSER. The only backside tributary at MAC is the MAXI system. There are no other local tributaries or communications lines configured at this time.

A connectivity diagram for MAC is presented in Figure A-04.

Current Operations Statistics

MAC's average traffic volume and CIM rate are as follows:

- o Messages transmitted - 1,225 per month
- o Messages received - 25,225 per month
- o CIM rate - .33%

The traffic volume has been steadily increasing at the rate of 10-15% per year, while the CIM rate has been declining dramatically. This decrease in CIMs is largely due to the increased format checking and stricter security checks placed on each message by the CSP.

With MAC's current message volume and single disk configuration, the online message storage capacity is approximately 37 days.

Virtually all of the incoming messages are reviewed and routed by the MDC operator. However, approximately 90% of these messages are routed to the MAXI system.

The station reliability rate for MAC has averaged 97.4%. This reflects total system reliability and includes both hardware and software downtimes as well as PMIs.

Future Operations

A PDP 11/45 has been procured and configured with 128K memory. This will be used as an alternate CSP processor in the near term. This new configuration will include a second BR1538D disk drive to allow a standard message file disk. In the long term, there are plans to procure a PDP 11/44 and migrate the CSP software to that processor.

SITE: MAC (MA)

RELEASE: 2.2C1

STATUS: OPERATIONAL 28-OCT-81

DATE OF INSTALLATION: 28-OCT-81

REMARKS: CHANGE 2 UPGRADE SCHEDULED IN JANUARY. 1983

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UNIQUE MODULES:

NONE

Figure A-03 MAC Configuration Status

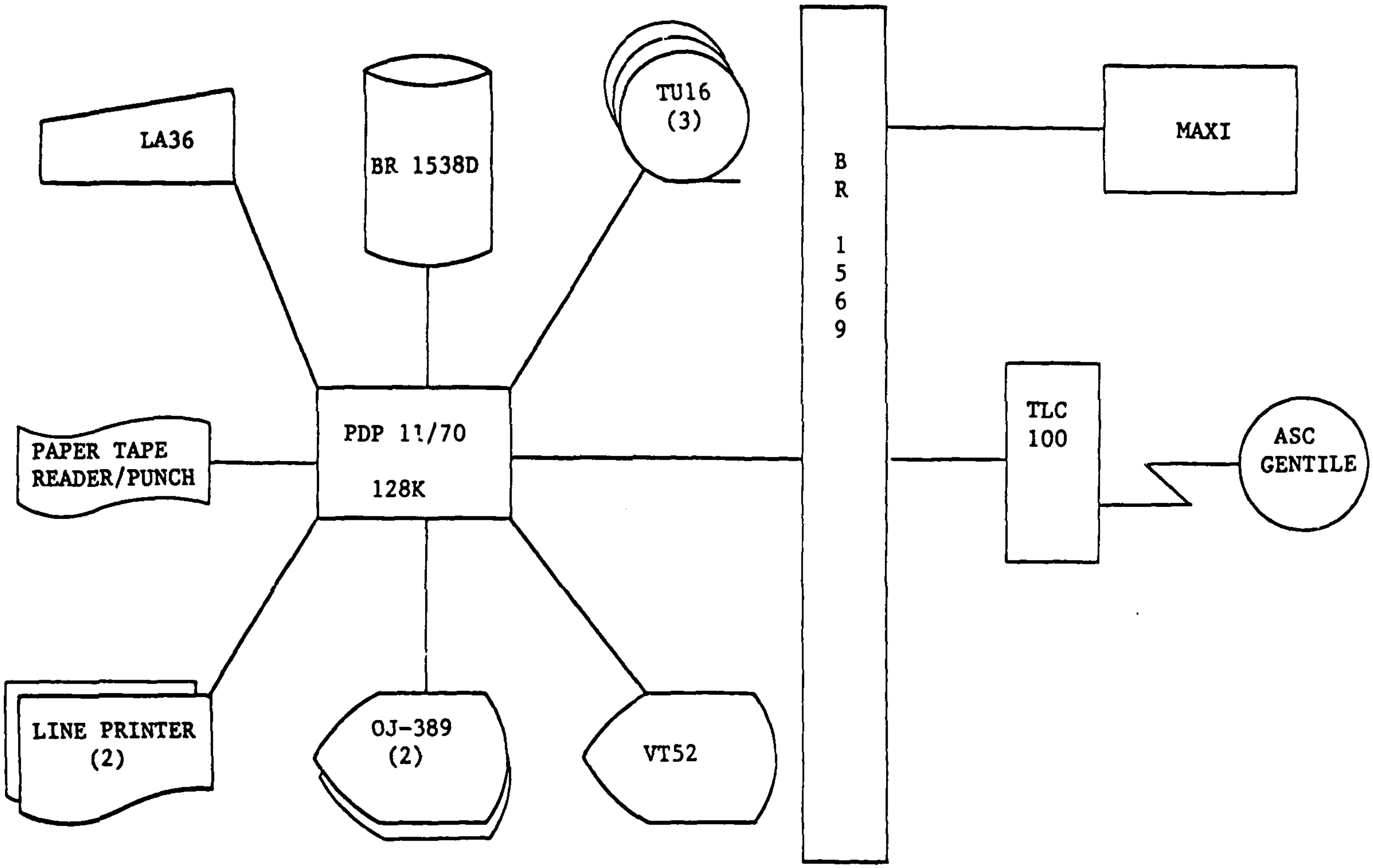

Figure A-04 MAC Connectivity Diagram

An additional change anticipated is to obtain a second TLC100 and a link to Tinker ASC and become dual-homed to provide redundancy and faster service.

Site Personnel

The CUBIC/CSP on-site representative at MAC is Mr. Charles Ramsey, Informatics.

Mr. Ramsey has been instrumental in the high rate of success that CSP has achieved at MAC. He has performed problem analysis and resolution in a timely manner and has responded around-the-clock to online system problems. He has also successfully converted the system to run on the PDP-11/45 on a test basis in preparation for operational implementation on that processor.

His day-to-day operations require him to interact with several intelligence divisions as well as data automation and communications center personnel.

TCATA, Fort Hood, Texas

Site Location

CSP was first installed in November, 1979, at the TRADOC Combined Arms Test Activity (TCATA), Fort Hood, Texas on a PDP-11/45. During September-October, 1981, the CSP software was moved to the home station PDP-11/70. In early November, 1981, TCATA was re-accredited by DCA, DIA and DA. In April, 1982, TCATA installed CSP in the Remote Communications Package (RCP), which was designed by our on-site consultant, Russell Goad, prior to his release from active duty.

TCATA's CSP primary mission is to provide a communications interface with user units during J.C.S., REDCOM and other units' exercises. TCATA's CSP also has a mission in testing the Joint Tactical Fusion Test Bed (JTFTB) located at both Fort Hood and Hurlbert Field, Florida.

Equipment Configuration

The local CSP at TCATA has the following hardware configuration:

- o CPU - One (1) PDP-11/70 with 2MB memory
- o System Console - One (1) LA36 DECwriter
- o Disk Drives - Two (2) BR1538D
- o Tape Drives - Two (2) Kennedy dual density drives (equivalent to TE16s)
- o Multiplexer - One (1) 32 channel BR1569
- o Line Printers - One (1) Houston Instrument electrostatic
- o AUTODIN Interface Device - One (1) TLC100
- o Message Distribution Console - One (1) OJ-389
- o Other equipment - One (1) VT100 terminal
One (1) DV11 multiplexer
One (1) Paper tape reader

The Remote Communications Package (RCP) CSP is configured slightly differently:

- o CPU - One (1) PDP-11/70 with 1 MB memory
- o System Console - One (1) LA36 DECwriter
- o Disk Drives - Two (2) BR1538D

- o Tape Drives - Two (2) Kennedy dual density drives (equivalent to TE16s)
- o Multiplexer - Two (2) 16 channel BR1569
- o Line Printers - One (1) LP11Y
- o AUTODIN Interface Device - One (1) TLC100
- o Message Distribution Console - One (1) OJ-389
- o Other Equipment - One (1) VT100 terminal
  One (1) DV11 multiplexer
  One (1) Paper tape reader

Software Configuration

Figure A-05 contains a site report extracted from Informatics Configuration Management System. This report reflects the current software release level for this site, the date of software installation and implementation and a status of pending releases. Also included are any site-unique modules developed for this particular site.

Communications Configuration

The connectivity of the two CSPs at TCATA varies depending on the exercise being supported. Generally, however, there is a link to one ASC and anywhere from one to eight MOD-40 teletypes configured as Mode II devices. Also, if the exercise dictates, there could be a satellite CSP-to-CSP link activated via the satellite communications gateway.

The backside computer interface at the local CSP consists of a receive link from the PDP-11/70 configured as a Tactical Simulator (TACSIM) Output Message Control and Timer (TOMCAT). During exercises the TACSIM processor, a VAX 11/780, generates messages through the TOMCAT which releases them to CSP on a timed, controlled basis. CSP then forwards them to their destination.

The local lines consist of the MOD-40 teletypes mentioned above which can be operated either locally or remotely. There are no other local tributaries.

A connectivity diagram for TCATA is presented in Figure A-06.

Current Operations Statistics

Since TCATA is not an operational site, there is not a constant traffic load. However, during the exercise periods, the TCATA CSP handles approximately 1800 to 2000 messages per day. If this volume were sustained for an extended period this equates to 54,000 to 60,000

SITE: TCATA (TC)

RELEASE: 2.2C2

STATUS: EXPERIMENTAL 30-APR-82

DATE OF INSTALLATION: 30-APR-82

REMARKS: NONE

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UNIQUE MODULES:

NONE

Figure A-05 TCATA Configuration Status

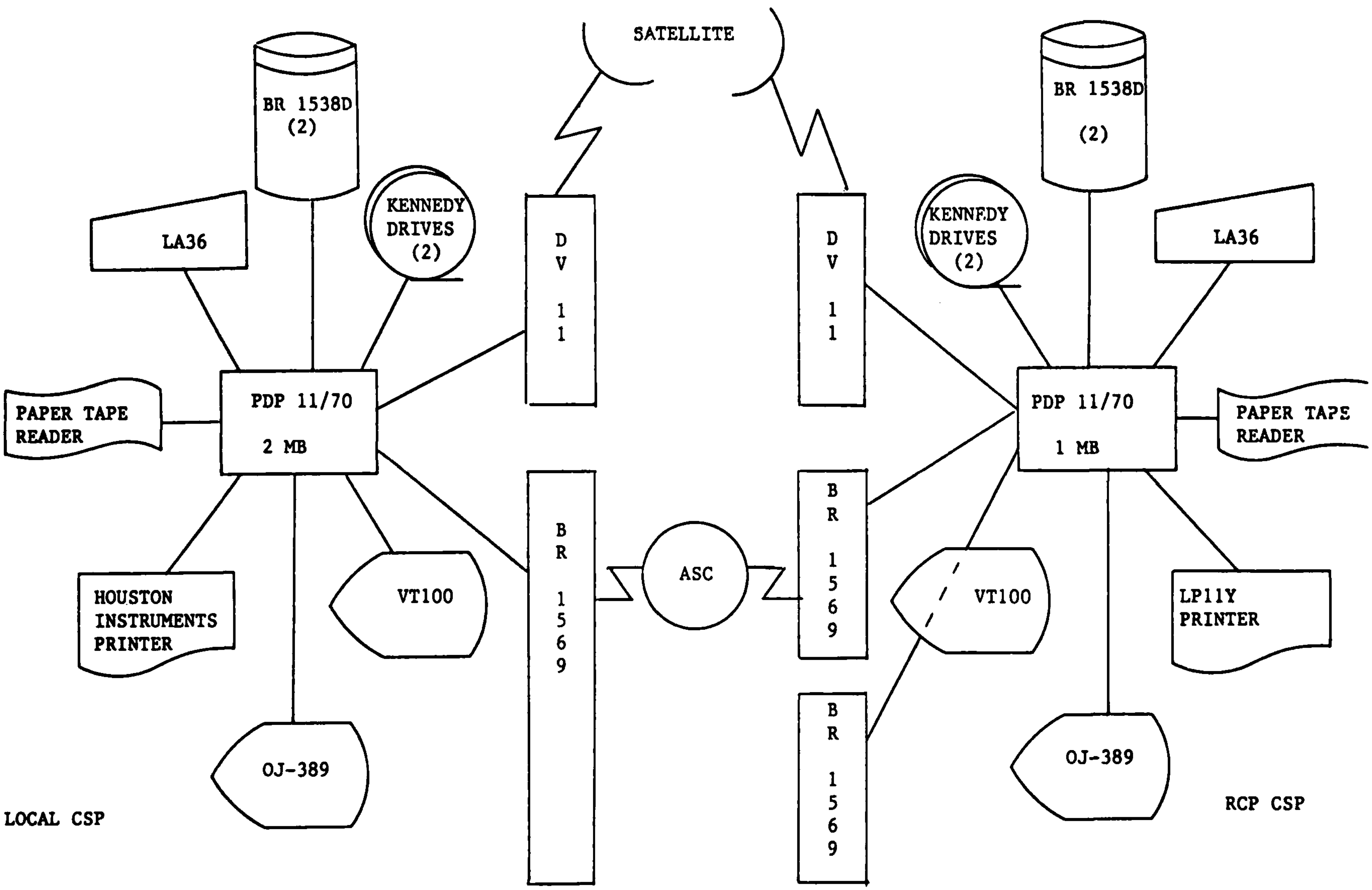

Figure A-C6 TCATA Connectivity Diagram

messages per month, or almost double the average volume for most CSP sites. CIM rates are not calculated during exercise periods, so none are available.

The hardware and software reliability has been excellent at TCATA. During the two and one-half years that CSP has been used at TCATA, there has never been a time that TCATA has not been able to support its users due to software or hardware downtimes. The only system outages have been caused by communications line outages.

Given the high message volume and the small amount of disk storage allocated for the message file, the current configuration allows for approximately 50 days online storage.

Approximately 99% or virtually all of the messages received are automatically or derivatively routed by the CSP. This requires very little operator intervention.

Future Operations

An analysis is underway to replace the PDP-11/70 in the RCP with a daisy chain of PDP-11/44s and 11/24s. As the RCP is deployed, more information will be gathered on the evolution of the CSP in the tactical environment.

Site Personnel

At the present time the on-site representative at TCATA is Ms. Elizabeth Crenshaw, Informatics.

The on-site personnel have made several significant accomplishments. From the time CSP was first installed on the TCATA PDP-11/45 system in November, 1979, and deployed for its first major successful exercise to Europe, January 1980, Informatics trained TCATA's operators and assisted TCATA in passing its first AUTODIN accreditation test. During the fall of 1980, Informatics was given the task of writing a gateway to interface with the TCATA TOMCAT, a replacement for SSB. In the fall of 1981, Informatics was again tasked to write a site unique gateway, SCMCON. This gateway allowed CSP-to-CSP communications over a Satellite link. Informatics also assisted in integrating the CSP software onto the same computer system as the TOMCAT resides. In November of 1981, the present system successfully passed a Category III AUTODIN accreditation test.

During day-to-day operations the Informatics personnel interface with the user organization through the Systems and Computer Operations branch of the Battlefield Automation Test Directorate, TCATA. They work very closely with several branches of the Special Projects and Simulation Division as well as contractors from Eaton Corporation and BDM.

USAFE, Ramstein AB, Germany

Site Location

CSP was installed at HQ United States Air Force Europe (USAFE), Ramstein AB, Germany in August, 1981. It is located in the USAFE Combat Operations and Intelligence Center (COIC) and supports the intelligence analysts by providing a communications path to AUTODIN for transmission and reception of AUTODIN messages.

The primary function of CSP is to be the front-end processor for the MAXI system at USAFE and to support various intelligence communications circuits. A secondary role is the automation of the AFSSO TCC at USAFE.

Equipment Configuration

The USAFE CSP is configured on the following hardware:

- CPU - One (1) PDP-11/70 with 256K memory
- System Console - One (1) LA36 DECwriter
- Disk Drives - Four (4) BR1538C
Two (2) RK05
- Tape Drives - Three (3) TE16
- Multiplexer - One (1) BR1569
- Line printers - One (1) LP05
- AUTODIN Interface Device - Two (2) TLC100
- Message Distribution Console - Three (3) OJ-389
- Other Equipment - One (1) VT100 terminal

There is currently no backup CPU dedicated for CSP use at USAFE.

Software Configuration

Figure A-07 contains a site report extracted from Informatics Configuration Management System. This report reflects the current software release level for this site, the date of software installation and implementation and a status of pending releases. Also included are any site-unique modules developed for this particular site.

SITE: USAFE COIC (CO)

RELEASE: 2.2C2

STATUS: OPERATIONAL 26-JUL-82

DATE OF INSTALLATION: 20-JUN-82

REMARKS: NONE

****

UNIQUE MODULES:

MODULES: TLCCON.MAC
IDENT: V2.2C01
DESCRIPTION:
    ASC BALANCING, 'EM' STRIPPING

Figure A-07 USAFE COIC Configuration Status

Communications Configuration

The CSP at USAFE is dual-homed to AUTODIN via Pirmasens and Croughton ASCs. There are two backside processors configured at USAFE. There is a direct link to the MAXI system for analyst support as well as a link to the COIC host processor. There are currently no remote communications lines configured at this site.

A connectivity diagram for USAFE is presented in Figure A-08.

Current Operations Statistics

USAFE's average traffic volume and CIM rate are as follows:

- o Messages transmitted - 400 per month
- o Messages received - 33,000 per month
- o CIM rate - not reported

With USAFE's current traffic volume and message file size, the average on-line message storage capacity is approximately 30 days. Virtually all of the incoming traffic is routed automatically via derivative routing indicator to the MAXI system.

The average reliability of the CSP software at USAFE is 99.7%. This figure only includes outages attributed to software.

Future Operation

The CSP at USAFE may, in the future, front-end the WWMCCS system and BETA/LOCE. This is dependent upon government decisions to examine these interfaces and requirements in depth. A MAXI system will be connected from the OSC as a GENSER-only backside tributary. The additional traffic load expected is approximately 3000 messaages per day.

An additional PDP-11/70 has been ordered to serve as a backup processor for CSP. This is expected in the fall of 1982.

Site Personnel

The CSP on-site representative at USAFE is Mr. Raymond Murphy, PRC. His daily operations require direct interface with the HQ USAFE intelligence and communications staffs.

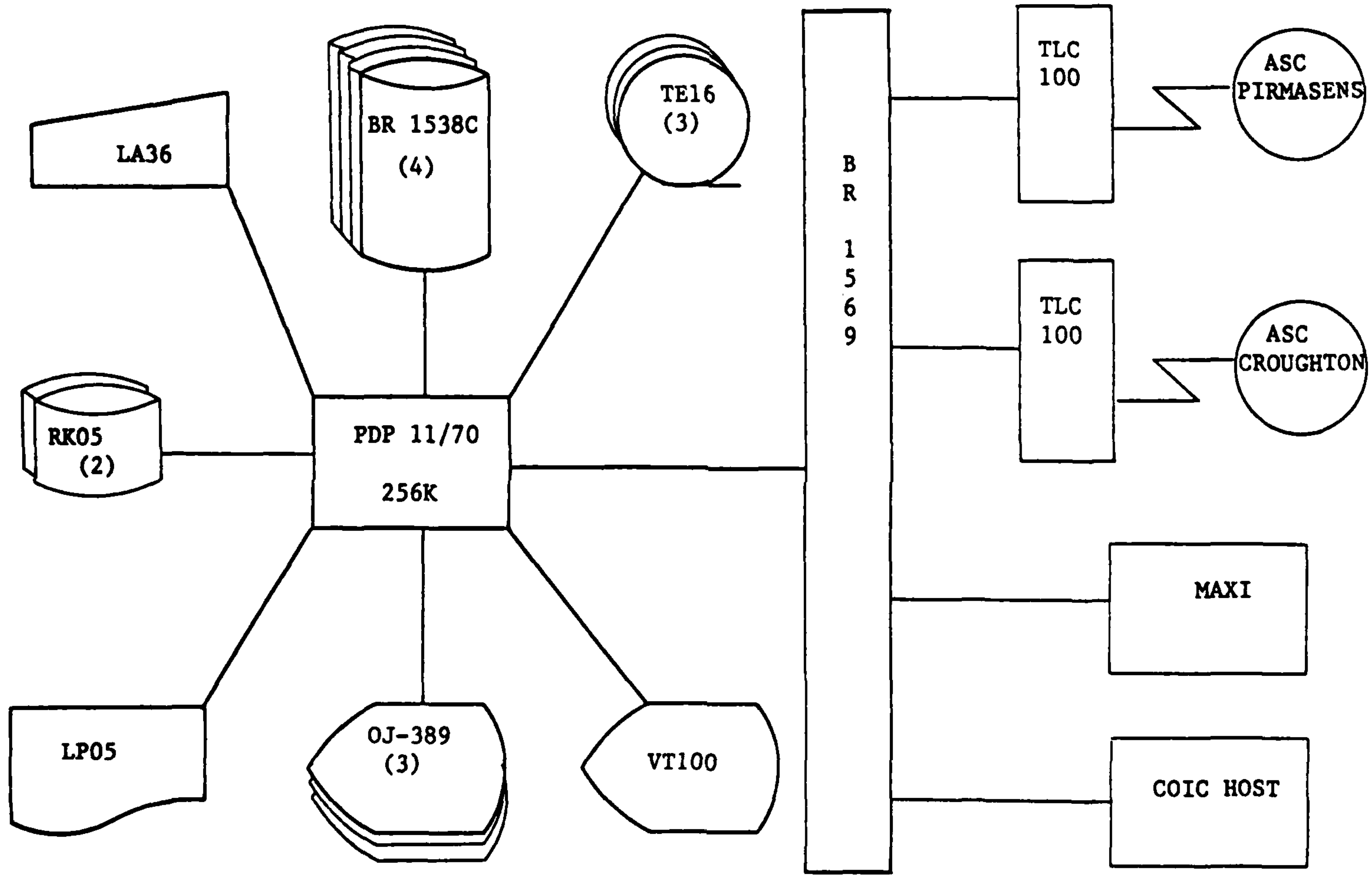

Figure A-08 USAFE Connectivity Diagram

LANTCOM, Norfolk, Virginia

Site Location

CSP was installed at CINCLANTFLT, Norfolk, Virginia in October, 1981 and is being operated by U.S. Navy data processing personnel.

CSP's primary mission is to provide continuous message handling support for CINCLANTFLT's Consolidated Intelligence Communication Center (CICC). In addition to processing messages destined for CINCLANFLT, the CICC guards for all major and most subordinate commands within the immediate area. Numerous ships and embarked staffs require message support depending upon ship movements.

Equipment Configuration

The CSP at LANTCOM is currently implemented on the following hardware for the primary system:

- CPU - One (1) PDP-11/70 with 320K memory
- System Console - One (1) LA36 DECwriter
- Disk drives - Two (2) BR1538C (shared)
Three (3) BR1538D (shared)
- Tape drives - Two (2) TE16
- Multiplexer - One (1) BR1569 (shared)
One (1) SMC200
One (1) T-16
- Line printers - Two (2) MOD-40 printers (shared)
One (1) LP11RA (shared)
- AUTODIN Interface Device - Two (2) Inteq 1A-5100 (shared)
- Message Distribution Console - Three (3) OJ-389 (shared)
- Other Equipment - One (1) VT100 terminal
One (1) CompuScan COMET OCR (shared)
One (1) AN/FGT-7 paper tape reader (shared)
Two (2) AN/FGR-10 paper tape punch (shared)
Two (2) MOD-40 remote printers (shared)

The backup system is configured almost identically to the primary. Those items listed as "shared" above are switchable between the two processors. Otherwise, the backup system has one PDP-11/70 with 384K memory, one LA36, and two TE16 tape drives. This processor also has two RK05 disk drives.

Software Configuration

Figure A-09 contains a site report extracted from Informatics Configuration Management System. This report reflects the current software release level for this site, the date of software installation and implementation and a status of pending releases. Also included are any site-unique modules developed for this particular site.

Communications Configuration

The LANTCOM CSP is dual-homed with links to Andrews and Ft. Detrick ASCs. There are two ZICON circuits, one transmit/receive and one receive only. Other remote communications lines consist of two MOD-40 printers located at LEC and FOSIC.

The backside computer interface at LANTCOM is configured as an MSS line which terminates in the CAMHS PDP-11/70 processor. This link is transmit only.

A connectivity diagram for LANTCOM is presented in Figure A-10.

Current Operations Statistics

LANTCOM's average traffic volume and CIM rate are as follows:

- o Messages transmitted - 2,475 per month
- o Messages received - 45,000 per month
- o Line blocks transmitted - 52,700 per month
- o Line blocks received - 1,100,000 per month
- o CIM rate - .81%

Even with the high volume processed by LANTCOM, the CSP is able to maintain approximately 35 days of online storage. A low CIM rate has been maintained as a result of the extensive format and security checks performed by CSP.

All incoming messages are received and routed by MDC operators; none are automatically or derivatively routed.

The station reliability for LANTCOM including both hardware and software outages is approximately 99.5%.

SITE: CINCLANT J-2 (LA)

RELEASE: 2.2C2

STATUS: OPERATIONAL 24-APR-82

DATE OF INSTALLATION: 25-APR-82

REMARKS: NONE

****

UNIQUE MODULES:

MODULES: FRMTCK.MAC
IDENT: V2.2LA2
DESCRIPTION:
BYPASS LINE VALIDATION FOR ALL FORMAT LINES EXCEPT 2 AND 16 FOR CRITIC MESSAGES. APPEND CORRECT EDM SEQUENCE IF MISSING OR INCORRECT. CRITIC MESSAGE INCORRECTLY FORMATTED ARE BEING DELAYED DUE TO REJECTION TO THE SVC. THE TIMELINESS REQUIRED FOR CRITIC MESSAGES DEMANDS IMMEDIATE PROCESSING.

MODULES: INGATE.MAC
IDENT: V2.2LA1
DESCRIPTION:
INTERFACE UNIQUE ROMS

MODULES: ITQCON.MAC
IDENT: V2.2LA1
DESCRIPTION:
INTEQ AID-21
RENAMED FROM TLCCON

Figure A-09 CINCLANT J-2 Configuration Status

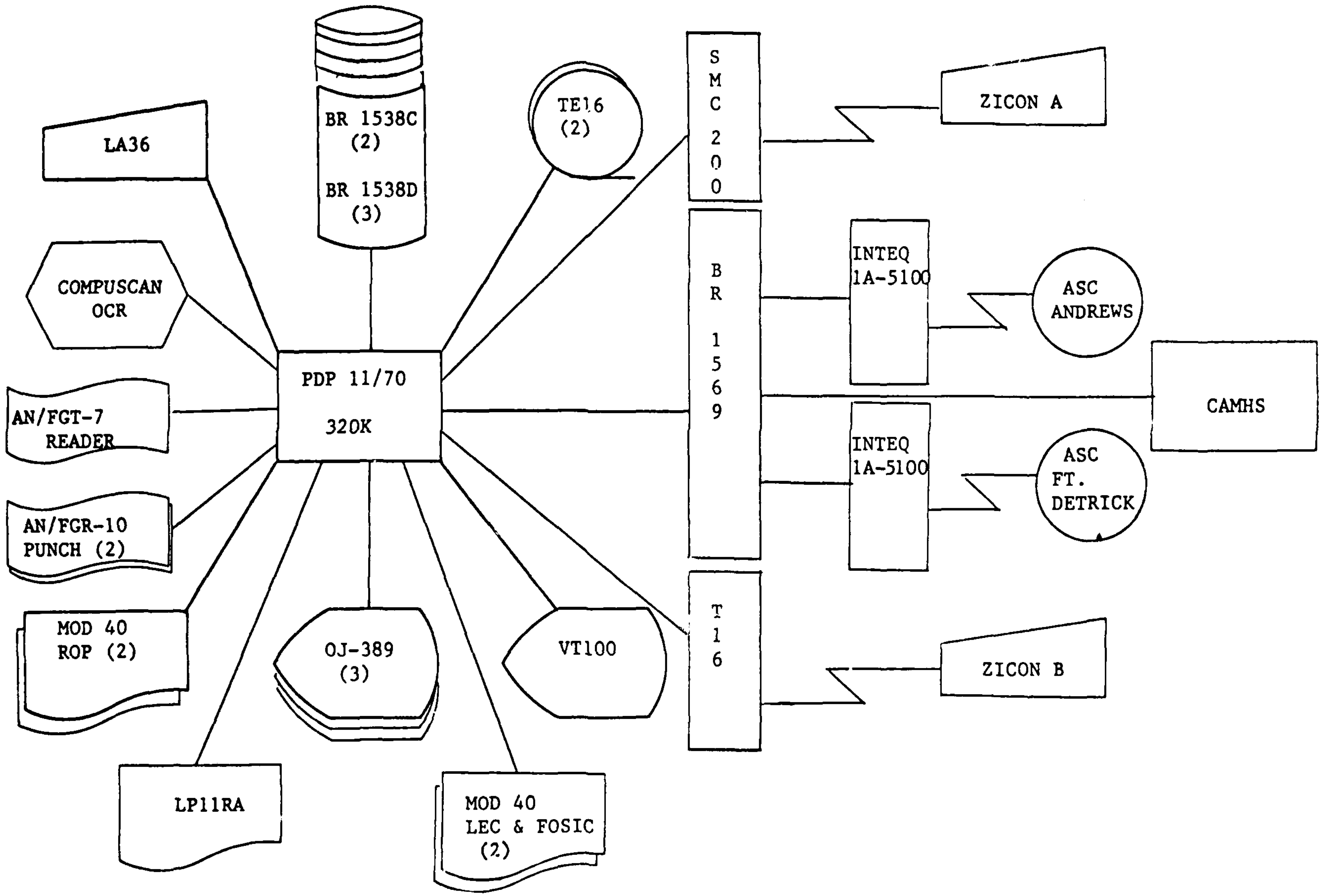

Figure A-10 LANTCOM Connectivity Diagram

Future Operations

There are plans to implement a transmit/receive interface to the OSIS baseline SUBLANT, and upgrade the CAMHS interface to full duplex. The software will have to be reconfigured to add the additional lines and queues as necessary to support these changes. When this occurs, there will be somewhat of an increase in the traffic load on the CSP.

With the implementation of CSP Release 2.3, LANTCOM plans to convert to a dumb optical character reader and use the PLA capabilities of the CSP.

Site Personnel

The CUBIC/CSP on-site representative at LANTCOM is Mr. John Strama, Informatics. Mr. Strama works closely with both the data processing and communications staffs of CINCLANTFLT in his daily operations. His primary point of contact is CINCLANTFLT-J291.

FTD, Wright-Patterson AFB, Ohio

Site Location

CSP was installed at the Foreign Technology Division (FTD), Wright-Patterson AFB, Ohio in June, 1982.

FTD produces scientific and technical intelligence (S&TI) to provide current foreign aerospace technical threat assessments for use in AFSC systems planning an acquistion. In addition, FTD is responsible for providing foreign aerospace technological data and data analysis support to HQ USAF, major commands, NASA, agencies of the national intelligence community and R&D support.

CSP supports this mission by providing real time transmission and reception of AUTODIN message communications.

Equipment Configuration

The CSP is currently implemented on the following equipment:

- CPU - One (1) PDP-11/70 with 192K memory
- System Console - One (1) LA36 DECwriter
- Disk Drives - Two (2) BR1538C
- Tape Drives - Three (3) TU16 drives
- Multiplexer - One (1) 32 channel BR1569
- Line Printers - Two (2) Dataproducts 2267, 600 lpm
One (1) Dataproducts 2470, 1200 lpm
- AUTODIN Interface Device - One (1) TLC100
- Message Distribution Console - Two (2) OJ-389
- Other Equipment - Two (2) ASR-28 paper tape readers
One (1) CR-11 card Reader
Two (2) VT-52 terminals

All of the above equipment is configured as one operational CSP. There is no second processor or set of peripherals to be used as a backup. The current backup will be provided manually through a DSTE.

Software Configuration

Figure A-11 contains a site report extracted from Informatics Configuration Management System. This report reflects the current software release level for this site, the date of software installation and implementation and a status of pending releases. Also included are any site-unique modules developed for this particular site.

Communications Configuration

The CSP is currently connected to the ASC at Gentile for online operations with the Andrews ASC permanently altrouted to the same line. In the event of a circuit outage, the Andrews line will be activated on the DSTE.

There are no other local tributaries configured as direct electrical links at this time. There are, however, five organizations with computer systems which are serviced with a magnetic tape interface. A connectivity diagram is illustrated in Figure A-12.

Current Operations Statistics

FTD's average traffic volume and CIM rate are as follows:

- o Messages transmitted - 1,825 per month
- o Messages received - 25,000 per month
- o Line blocks transmitted - 40,000 per month
- o Line blocks received - 900,000 per month
- o CIM rate - 1.45%

Given this traffic volume and the capacity of the message file, it is anticipated that the online message storage capacity will be approximately 35 days.

Since there are no automated backside processors, no messages are derivatively routed and all messages are manually received by the MDC operators. The MDC clerk determines routing for all incoming messages and places each message on selected output queues for either hardcopy or mag-tape distribution. Mag-tape messages are altrouted to the intercept tape during normal operation of CSP. Once daily, these messages are placed on their respective mag-tapes and hand-carried to the responsible organizations.

SITE: FTD (FT)

RELEASE: 2.2C2

STATUS: OPERATIONAL 27-SEP-82

DATE OF INSTALLATION: 25-JUN-82

REMARKS: NONE

****

UNIQUE MODULES:

MODULES: MD2CON.MAC
IDENT: V2.2FT1
DESCRIPTION:
    ENABLES PAPER TAPE READER

MODULES: MD2CTL.MAC
IDENT: V2.2FT1
DESCRIPTION:
    ENABLES THE PAPER TAPE READER

MODULES: MD2DAT.MAC
IDENT: V2.2FT1
DESCRIPTION:
    ENABLES PAPER TAPE READER

MODULES: MD2OT .MAC
IDENT: V2.2FT1
DESCRIPTION:
    ENABLES PAPER TAPE READER

MODULES: MD2OUT.MAC
IDENT: V2.2FT1
DESCRIPTION:
    ENABLES PAPER TAPE READER

MODULES: RELEAS.MAC
IDENT: V2.2FT1
DESCRIPTION:
    MODIFIED TO SUPPORT THIRD PRINTER

Figure A-11 FTD Configuration Status

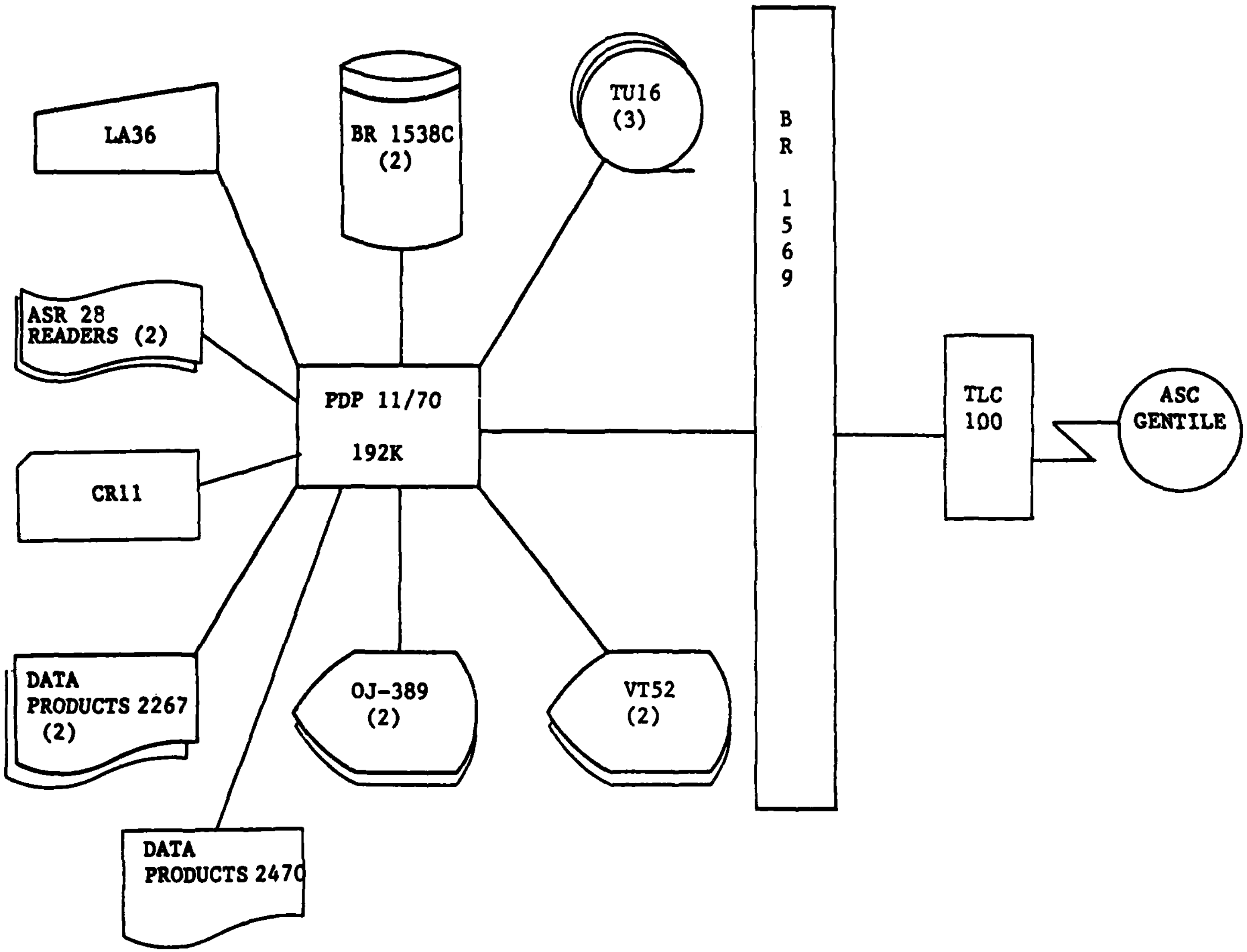

Figure A-12 FTD Connectivity Diagram

Future Operations

There are plans to procure one more OJ-389, an additional TLC100 and implement an optical character reader interface as the equipment becomes available. Also, at some point in the future the BR1538C disk drives will be upgraded to BR1538D drives, increasing the capacity to 300 MB each.

The problem with no CSP backup will be alleviated by the procurement of an additional PDP-11/70 system as soon as it is available.

With the implementation of CSP Release 3.0, a new capability will be provided to allow remote OJ-389 dissemination terminals. At this time, FTD's mode of operation will change to allow the MDC clerk to disseminate only administrative messages while all substantive intelligence messages will be routed by a remote intelligence staff. This should not impact total traffic volume but would shift the burden from the TCC operator.

Site Personnel

There are currently no contractor personnel on-site at FTD. All on-site maintenance is provided by FTD personnel for identification of problems and routine table maintenance. Problems will be resolved by the centralized development staff in Bellevue and solutions will be communicated to FTD personnel for implementation.

ADCOM, Colorado Springs, Colorado

Site Locations

CSP was installed at HQ Air Defense Command, Cheyenne Mountain Complex, Colorado Springs, Colorado in August, 1982, and was placed online in October, 1982.

The NORAD/ADCOM community provides surveillance, detection and early warning for the North American continent and its perimeters. The CSP will support this mission by providing real-time transmission and reception of *AUTODIN* message communications.

Equipment Configuration

The CSP is currently implemented on the following hardware for the primary system:

- CPU - One (1) PDP-11/70 with 256K memory
- System Console - One (1) LA120 DECwriter
- Disk Drives - Three (3) BR1538D (shared)
One (1) RK01
- Tape Drives - Two (2) TE16 (shared)
One (1) TE16
- Multiplexer - One (1) BR1731
- Line printers - One (1) LP11VA (shared)
One (1) LP11VA
- AUTODIN Interface Device - Two (2) TLC100 (shared)
- Message Distribution Console - Three (3) OJ-389 (shared)
- Other Equipment - One (1) PC11 Paper Tape Reader/Punch (shared)
One (1) CR11 Card Reader (shared)
One (1) VT100 terminal

The backup system is configured exactly the same as the primary system, so full redundancy is provided. Those items listed as shared are switchable between the two processors through a DT07 unibus switch.

Software Configuration

Figure A-13 contains a site report extracted from Informatics Configuration Management System. This report reflects the current software release level for this site, the date of software installation and implementation and a status of pending releases. Also included are any site-unique modules developed for this particular site.

Communications Configuration

ADCOM's CSP has links to two ASCs, McClellan and Tinker. In addition, there is a link to the NCMC command post which is configured as a Mode II circuit.

A connectivity diagram is presented in Figure A-14.

Current Operations Statistics

ADCOM's average traffic volume and CIM rate are as follows:

- o Messages transmitted - 1,800 per month
- o Messages received - 35,000 per month
- o CIM rate - 1.30% average

Given this traffic volume and the capacity of the message file, it is anticipated that the on-line message storage capacity will be approximately 40 days.

Future Operations

There are no known changes to the planned hardware configuration at ADCOM. However, as soon as CSP Release 3.0 is implemented, ADCOM plans to use the remote OJ-389 dissemination capability. The actual mode of operation, however, is unknown at this time.

Site Personnel

The CUBIC/CSP on-site representative at ADCOM is Ms. Bonnie Rosado, Informatics. She interfaces on a daily basis with the ADCOM communications staff.

SITE: ADCOM (AD)

RELEASE: 2.2C2

STATUS: OPERATIONAL 25-OCT-82

DATE OF INSTALLATION: 20-AUG-82

REMARKS: NONE

****

UNIQUE MODULES:

NONE

Figure A-13 ADCOM Configuration Status

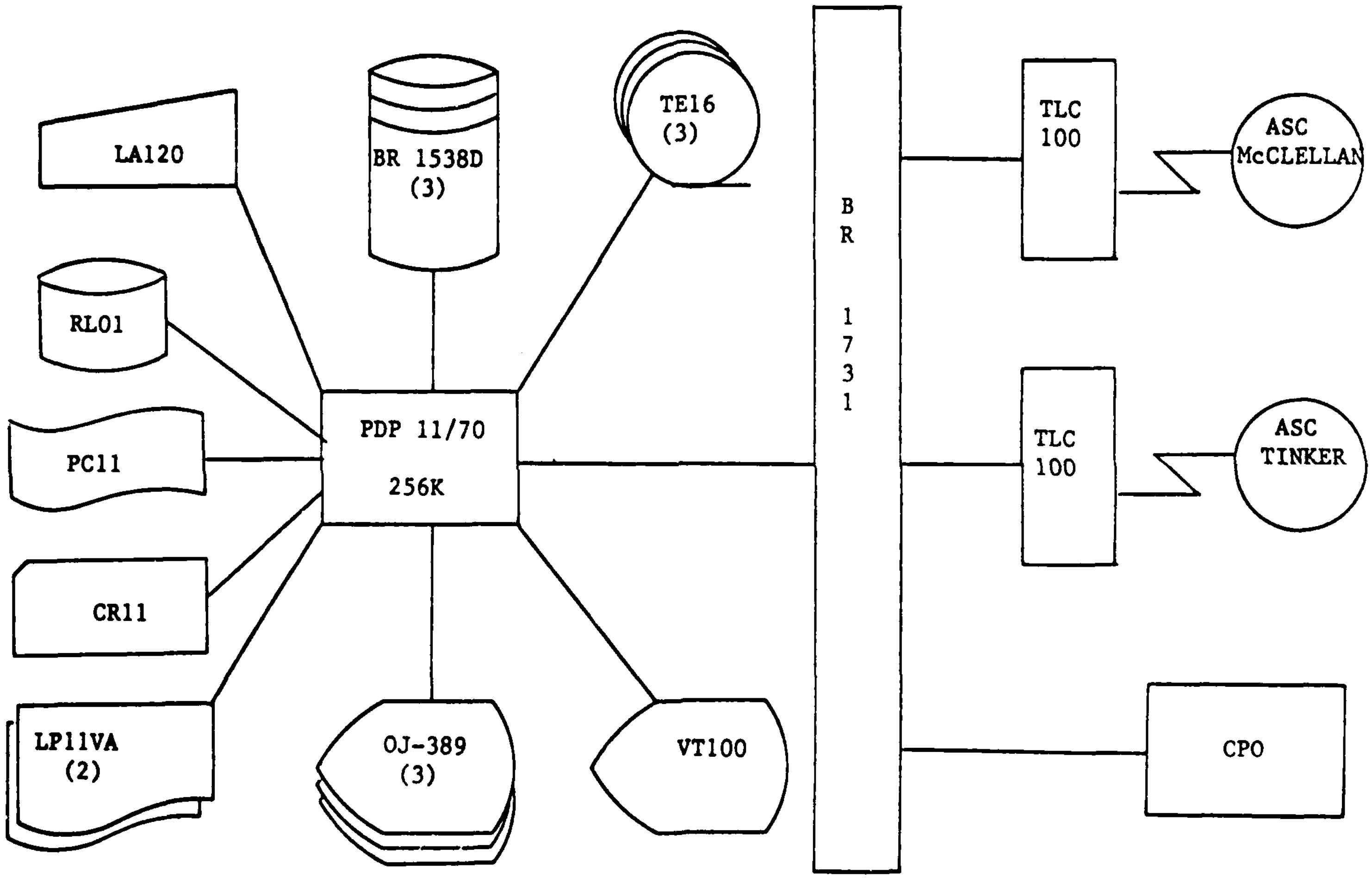

Figure A-14 ADCOM Connectivity Diagram

HQ CINCPAC, Camp H.M. Smith, Hawaii

Site Location

CSP was installed at HQ Commander-in-chief Pacific in July 1979. This installation was reaccredited by DIA and DCA in July 1982. The occasion for this reaccreditation was the implementation of the Fully Automated Routing of Messages (FARM) software package developed by the CSP programmer assigned to CINCPAC. This software package will be included in the CUBIC/CSP baseline, and will be distributed to CSP users as their systems are updated with the current baseline.

The Pacific Command (PACOM) area consists of approximately 96 million square miles and contains two-thirds of the world's population. The type, level and degree of threat to U.S. national interest ranges from the strategic nuclear forces of the Soviet Union to the guerrilla/insurgency threat in the Southern and Southeast Asian areas. The mission of the Commander-in-chief, Pacific (CINCPAC), is "To maintain the security of PACOM and defend the United States against attack through the Pacific Ocean; to support and advance the national policies and interests of the United States and discharge U.S. military responsibilities in the Pacific, Far East, Southeast and South Asia; to prepare plans, conduct operations and coordinate activities of the forces of the PACOM in consonance with directives of higher authority."

CSP provides DSSCS Communications Support for transmission and reception of real-time AUTODIN messages in support of CINCPAC's mission. In addition, the CSP functions as a front-end processor for the PACOM Data Systems Center (PDSC) system, which directly support CINCPAC's intelligence analysts. The PDSC computer system is a derivative of the MAXI system.

Equipment Configuration

The CSP at CINCPAC is currently implemented on the following hardware for the primary system:

- CUP - One (1) PDP-11/70 with 256K memory
- System console - One (1) LA36 DECwriter
- Disk drives - Three (3) BR1538D (shared)
- Tape drives - Two (2) TE10
Three (3) TU45 (shared)
- Multiplexer - One (1) 36 channel BR1569
- Line printers - One (1) LP11 RA (shared)
Two (2) TT Model 4010 (shared)
One (1) TT Model 4030 (shared)

- AUTODIN interface device - Two (2) INTEQ (shared)
- Message distribution console - Three (3) OJ-389 (shared)
- Other equipment - One (1) VT52 Terminal (shared)
  Four (4) Paper Tape Reader/Punch (shared)
  One (1) Card Reader (shared)
  One (1) Unibus-Unibus link
  One (1) OCR (shared)

The backup system is configured identically to the primary. Those items listed as "shared" above are switchable between the two processors. Additionally, individual circuits terminating in the BR1569 multiplexer are switchable between both processors.

Software Configuration

Figure A-15 contains a site report extracted from Informatics Configuration Management System. This report reflects the current software release level for this site, the date of software installation and implementation, and a status of pending releases. Also included are any site unique modules developed for this particular site.

Communications Configuration

The CSP is dual-homed to McCellan and Wahiawa ASCs for online tributary operations, DSSCS only. The only backside tributary at CINCPAC is the PDSC system, a derivative of the MAXI system.

A connectivity diagram for CINCPAC is presented in Figure A-16.

Current Operations Statistics

- Messages transmitted - 1,500 per month
- Messages received - 53,600 per month
- CIM Rate - 2%

The CSP is able to maintain approximately 60 days of online storage. CINCPAC has been able to maintain a low CIM rate due to the extensive format and security checks performed by the CSP.

Approximately 75% of the incoming messages are derivatively routed to PDSC. The remainder are routed by the Message Distribution Clerk.

The reliability for CINCPAC including both hardware and software outages is approximately 99%.

SITE: CINCPAC (PD)

RELEASE: 2.2C2

STATUS: OPERATIONAL 30-JUL-82

DATE OF INSTALLATION: 23-JUL-82

REMARKS: NONE

****

UNIQUE MODULES:

MODULES: ARMMCR.MAC
IDENT: V2.2PD1
DESCRIPTION:
FARM UPDATE PROGRAM

MODULES: ARUPDT.MAC
IDENT: V2.2PD1
DESCRIPTION:
NONE

MODULES: AUTCON.MAC
IDENT: V2.2PD1
DESCRIPTION:
INTEQ AID

MODULES: AUTORM.MAC
IDENT: V2.2PD1
DESCRIPTION:
PDSC FARM MODULE.

MODULES: CANCON.MAC
IDENT: V2.2PD1
DESCRIPTION:
MODIFIED FOR IMPLEMENTATION OF A VFK TO INPUT A CANNED CRITIC HEADER.

MODULES: COMMLC.MAC
IDENT: V2.2PD1
DESCRIPTION:
PROCESS ON/OFF REQUEST FOR PDSC LINES

MODULES: DCTRDR.MAC
IDENT: V2.2PD1
DESCRIPTION:
NONE

MODULES: DCTREF.MAC
IDENT: V2.2PD1
DESCRIPTION:
NONE

Figure A-15 CINCPAC Configuration Status (Page 1 of 4)

MODULES: DECODE.MAC
IDENT: V2.2PD1
DESCRIPTION:
MODIFIED FOR IMPLEMENTATION OF ADDITIONAL FIXED DISSEMINTATION VFK'S. ALSO MODIFIED FOR IMPLEMENTATION OF A VFK TO INPUT A CANNED CRITIC HEADER.

MODULES: DINCON.MAC
IDENT: V2.2PD1
DESCRIPTION:
AUTODIN TEST MESSAGE GENERATION (VERSION OF FCSCON).

MODULES: DISSEM.MAC
IDENT: V2.2PD1
DESCRIPTION:
MODIFIED FOR IMPLEMENTATION OF ADDITIONAL FIXED DISSEMINATION VFK'S. MADE CORRECTION TO BUG IN REF RECORD DISK ACCESS GENERATION.

MODULES: DMCDRV.MAC
IDENT: V2.2PD1
DESCRIPTION:
PDSC DMC MODULE(S) STATUS UNKNOWN.

MODULES: DMCGTY.MAC
IDENT: V2.2PD1
DESCRIPTION:
PDSC CMD MODULE(S) STATUS UNKNOWN.

MODULES: DSPACS.MAC
IDENT: V2.2PD1
DESCRIPTION:
DISPLAY MSS LINE STATUS

MODULES: FARM .MAC
IDENT: V2.2PD1
DESCRIPTION:
MCR CONTROL.

MODULES: FCSCON.MAC
IDENT: V2.2PD1
DESCRIPTION:
NONE

MODULES: KPTA .MAC
IDENT: V2.2PD1
DESCRIPTION:
MOD 40 PSEUDO HANDLER.

MODULES: MSSGWY.MAC
IDENT: V2.2PD1
DESCRIPTION:
GATEWAY FOR PDSC TO CSP.

MODULES: OCRCON.MAC
IDENT: V2.2PD1
DESCRIPTION:
NONE

Figure A-15 CINCPAC Configuration Status (Page 2 of 4)

MODULES: OEEGWY.MAC
IDENT: V2.2PD1
DESCRIPTION:
NONE

MODULES: OSUPDT.MAC
IDENT: V2.2PD1
DESCRIPTION:
MODIFIED FOR IMPLEMENTATION OF ADDITIONAL FIXED DISSEMINATION VFK'S. ALSO MODIFIED FOR IMPLEMENTATION OF A VFK TO INPUT A CANNED CRITIC HEADER.

MODULES: PAGCON.MAC
IDENT: V2.2PD1
DESCRIPTION:
MODIFIED TO DELETE ALL OF THE OLD COPY OF A MESSAGE WHEN THE MESSAGE IS EDITED. CARRY OVER OF INPUT CDSN FROM THE OLD TO THE NEW COPY OF A MESSAGE WHEN IT IS EDITED. NOW PROVIDES CAPABILITY TO PAGE FORWARD THROUGH A MESSAGE RETURNING TO THE FIRST PAGE AFTER THE LAST PAGE HAS BEEN DISPLAYED. MADE CORRECTION TO PREVENT OCCASIONAL CORRUPTION OF A MESSAGE WHEN THE NEW LINE KEY IS USED. MADE CORRECTION TO ELIMINATE THE PERIODIC LOCK-OUT OF THE TERMINAL PAGING KEYS. MADE CORRECTION TO THE HANDLING OF THE NEXT PREVENT PAGE KEYS WHILE THE TEMINAL IS BUSY.

MODULES: RDPGWY.MAC
IDENT: V2.2PD1
DESCRIPTION:
NONE

MODULES: RESET .MAC
IDENT: V2.2PD1
DESCRIPTION:
MODIFIED FOR IMPLEMENTATION OF ADDITIONAL FIXED DISSEMINATION VFK'S. MADE CORRECTION TO BUG IN REF RECORD DISK ACCESS GENERATION.

MODULES: STSTAT.MAC
IDENT: V2.2PD1
DESCRIPTION:
NONE

MODULES: SVCCON.MAC
IDENT: V2.2PD1
DESCRIPTION:
TEST MESSAGE GENERATION (VERSION OF FCSCON).

MODULES: TIMSTP.MAC
IDENT: V2.2PD1
DESCRIPTION:
SYSTEM CONSOLE TIME STAMP ROUTINE.

MODULES: TRMNEW.MAC
IDENT: V2.2PD1
DESCRIPTION:
MADE CORRECTION TO ELIMINATE THE PERIODIC LOCK-OUT OF TERMINAL PAGING KEYS. MADE CORRECTION TO THE HANDLING OF THE NEXT/PREVIOUS PAGE KEYS WHILE THE TERMINAL IS BUSY.

Figure A-15 CINCPAC Configuration Status (Page 3 of 4)

MODULES: TRMOLD.MAC
IDENT: V2.2PD1
DESCRIPTION:
MADE CORRECTION TO ELIMINATE THE PERIODIC LOCK-OUT OF TERMINAL PAGING KEYS. MADE CORRECTION TO THE HANDLING OF THE NEXT/PREVIOUS PAGE KEYS WHILE THE TERMINAL IS BUSY

MODULES: TSTCON.MAC
IDENT: V2.2PD1
DESCRIPTION:
TEST MESSAGE GENERATION (VERSION OF FCSCON).

MODULES: USEREQ.MAC
IDENT: V2.2PD1
DESCRIPTION:
MADE CORRECTION TO EXTRANEOUS DELIVERY OF MESSAGE WHEN RELEASE AUTHORITY IS GRANTED.

Figure A-15 CINCPAC Configuration Status (Page 4 of 4)

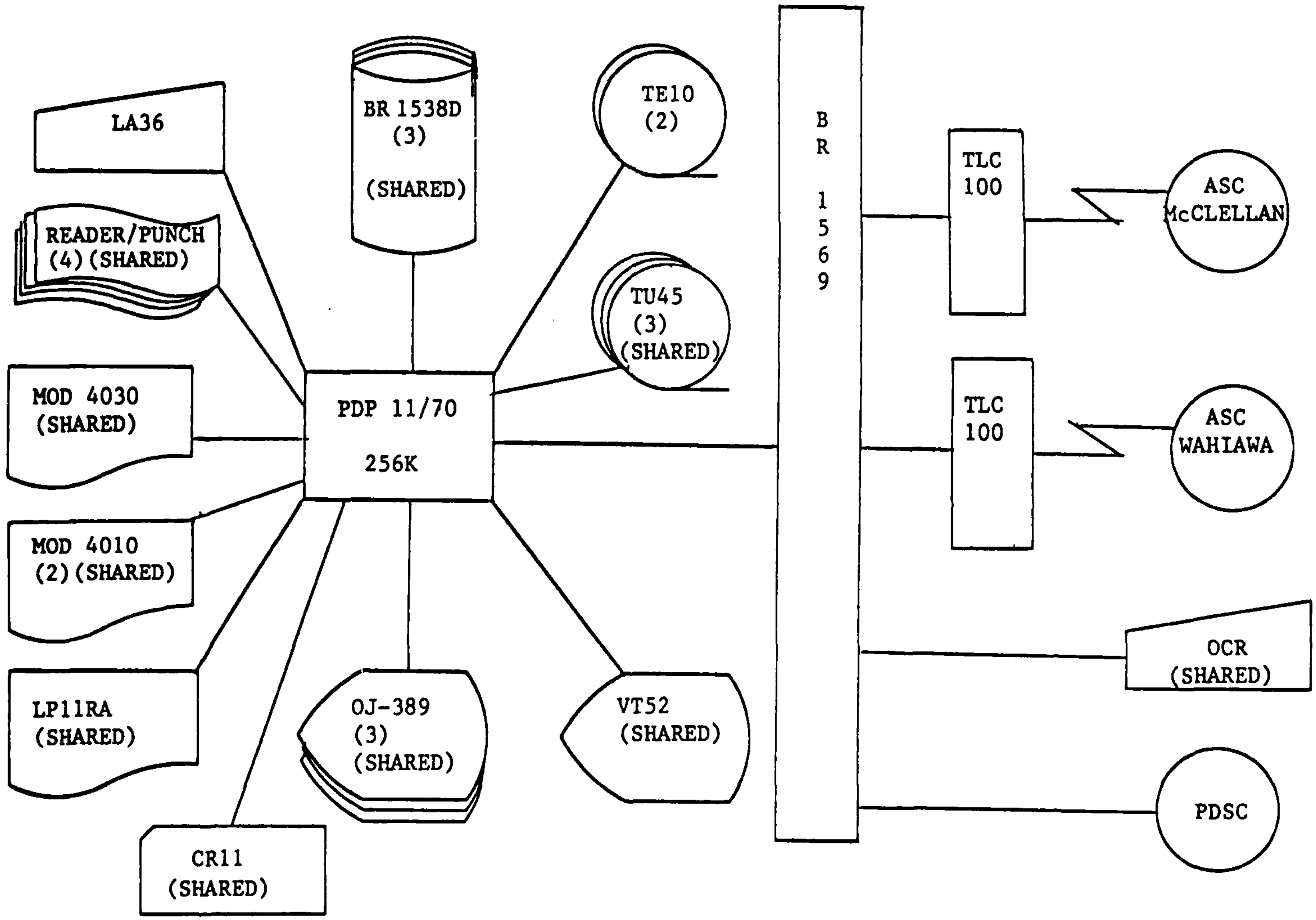

Figure A-16 CINCPAC Connectivity Diagram

Future Operations

CINCPAC was the first CSP site to implement the Fully Automated Routing of Messages (FARM) software. This software was developed by other contractor personnel at CINCPAC. This software is expected to reduce the amount of messages which must be manually disseminated by approximately 80%.

Site Personnel

There are no CUBIC/CSP on-site representatives at CINCPAC. Informatics facility at Bellevue coordinates with the communications personnel of CINCPAC to resolve system problems.

MISSION
of
Rome Air Development Center

RADC plans and executes research, development, test and selected acquisition programs in support of Command, Control Communications and Intelligence (C^3I) activities. Technical and engineering support within areas of technical competence is provided to ESD Program Offices (POs) and other ESD elements. The principal technical mission areas are communications, electromagnetic guidance and control, surveillance of ground and aerospace objects, intelligence data collection and handling, information system technology, ionospheric propagation, solid state sciences, microwave physics and electronic reliability, maintainability and compatibility.